Department of the Army

Integrated Training Area Management

"How-To" Manual

Draft

Prepared by the

United States Army Environmental Center

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PREFACE

This is the Department of the Army (DA) How-To Manual for the Army's Integrated Training Area Management (ITAM) Program, under proponency responsibility of the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS). This manual accompanies Army Regulation (AR) 350-4 and defines Headquarters, Department of the Army (HQDA), Major Army Command (MACOM), and Installation roles, responsibilities, and Army-wide guidance to implement ITAM. The policies, procedures, and guidance in this manual are essential to achieve and maintain the Army ITAM Program.

ITAM establishes procedures to achieve optimum, sustainable use of training and testing lands by implementing a uniform land management program that includes inventorying and monitoring land conditions, integrating training and testing requirements with training land carrying capacity, educating land users to minimize adverse impacts, and providing for training land rehabilitation and maintenance.

The ITAM Program is based on user requirements derived from continuous interaction among HQDA, MACOM, and installations. The fact that requirements are generated at lower levels and systematically validated at higher levels (MACOM and/or HQDA) enhances ITAM Program oversight and execution. Funds are executed in the specified Army Management System Code Program Element (AMSCO/PE) to preclude duplicative reporting.

The content in this manual applies to Active Army, Army Reserve, and National Guard installations that have a major training or testing mission, specifically, those assigned to or managed by the following MACOMs:

- Forces Command (FORSCOM)
- Training and Doctrine Command (TRADOC)
- National Guard Bureau (NGB)
- US Army Europe (USAREUR)
- US Army, Pacific (USARPAC)
- Eighth US Army (EUSA)
- Army Materiel Command (AMC), primarily the Test and Evaluation Command (TECOM)
- ATEC
- US Army Medical Command (MEDCOM)

- Military District of Washington (MDW)
- US Military Academy (USMA)
- US Army Reserve Command (USARC).

This manual applies to ITAM installations during partial mobilization, but is suspended during full mobilization, subject to Executive Order.

The proponent for this manual is the Deputy Chief of Staff for Operations and Plans (DCSOPS). The DCSOPS has the authority to approve exceptions to this publication that are consistent with controlling law and regulation. The DCSOPS may delegate this approval authority in writing to a Division Chief within the Proponent Agency in the grade of Colonel or civilian equivalent.

TABLE OF CONTENTS

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1.0 Introduction

This How-To Manual provides detailed information and comprehensive references on the Army's Integrated Training Area Management (ITAM) Program. It provides descriptions of policies and standard operating procedures (SOP) for the ITAM Program, which is under proponency responsibility of the Headquarters Department of the Army (HQDA) Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS).

This manual follows the policy set forth by Army Regulation (AR) 350-4,[1] which includes objectives, responsibilities, and policies for the ITAM Program. It establishes the procedures to achieve optimum, sustainable use of training lands, by implementing a uniform land management program that includes inventorying and monitoring of land conditions, integrating requirements with land carrying capacity, educating land users to minimize adverse impacts, and providing for training land rehabilitation and maintenance.

This manual describes how each of the ITAM components contributes to the overall objectives of sustaining a well-trained and equipped combat force through sound environmental stewardship of natural and cultural resources on lands under the control of the Army.

1.1 Army Training

The United States (US) Army must maintain the capability, through a total force effort, to put overwhelming land combat power on any future battlefield to defeat any potential enemies. A decisive victory depends on the ability to deploy rapidly, fight, self-sustain, and win quickly with minimum casualties.

In the 21st Century, the Army faces unprecedented challenges to its ability to train. Increased environmental regulation of training lands and ranges, coupled with increased economic development around Army installations all contribute to a more challenging training climate. A sound land management program that provides economical and acceptable planning and execution will be mandatory to protect that land as an essential asset for training**.**

The Army trains, as it will fight. Army training is designed to challenge soldiers, leaders, and units. As the Department of Defense's (DOD) premiere land force, the Army relies on land to achieve its training and testing objectives and maintain force readiness. Force readiness depends on high-quality realistic training. Not surprisingly, it is the use of these lands for training and testing purposes that causes damage that

[1] AR 350-4 is available for viewing and downloading via the ITAM website at **www.army-itam.com**. Copies are also available from the Training Directorate, ODCSOPS.

can potentially reduce the quality of training on these lands. It is in overcoming the apparent conflict between force readiness and stewardship that ITAM serves the overall needs of the Army.

1.2 Environmental Stewardship

Environmental stewardship is defined as the management and administration of the environment**.** As force structure is reduced, the base structure also declines, putting more pressure on the land, air, and water necessary to support the mission of maintaining a trained and ready Army. Consequently, environmental stewardship has emerged as an ethic for future national policies and actions. With more than 20 million acres at military installations and civil works projects, the Army is entrusted with the care of two-thirds of the DOD lands. A comprehensive environmental stewardship strategy builds on current achievements and provides a structure and framework for the Army to meet and fulfill the growing challenges of the 21st century.

The guiding principle of Army environmental stewardship is that all activities, including training and testing, must be environmentally sustainable and meet current needs without compromising the integrity of the environment for future generations. ITAM is a key part of the Army's commitment to environmental stewardship. Four of the Chief of Staff (CofS) of the Army's goals serve as the foundation for official ITAM policy. The four goals are as follows:

- Integrate environmental planning procedures into all operations
- Protect natural and cultural resources
- Ensure operations comply with environmental standards. Receive no notices of violation or fines for noncompliance
- Prevent future pollution and reduce hazardous waste and toxic releases.

1.3 ITAM Mission

The ITAM Program is the Army's formal strategy for focusing on sustained use of training and testing lands. The intent of the ITAM Program is to systematically provide a uniform training land management capability across the total Army. The Army will manage its' land in a sound manner **to ensure no net loss of training capability** to support current and future training and mission requirements. The effective integration of stewardship principles into training land and conservation management practices ensures that the Army's lands remain viable to support that training mission.

ITAM establishes a systematic framework for decision-making and management of Army training lands. It integrates elements of operational, environmental, master planning, and other programs to identify and assess land use alternatives. The ITAM Program thus supports sound natural and cultural resource management practices to

provide stewardship of land assets, while sustaining those assets to support training, testing, and other installation missions.

The US Army recognizes that the execution of training to doctrinal standards, under realistic combat conditions will affect the environment. The ITAM Program is an essential part of the Army's commitment to environmental stewardship.

1.4 ITAM Program Goals

The goals of the Army's ITAM Program are as follows:

1. Achieve optimal sustained use of lands for the execution of realistic training, by providing a sustainable core capability[2], which balances usage, condition, and level of maintenance

2. Implement a management and decision-making process, which integrates Army training and other mission requirements for land use with sound natural and cultural resources management

3. Advocate proactive conservation and land management practices

4. Align Army training land management priorities with the Army training, testing, and readiness priorities.

1.5 ITAM Program Objectives

The objectives for meeting the ITAM Program goals are as follows:

- Determine the capacity of the land to:
  - Sustain training and testing through diagnostic methods, models, and tools
  - Support assignment of the optimum type, frequency, duration and intensity of training and testing that can be conducted on a given parcel
  - Identify the risks and costs associated with exceeding the capacity **of the land**
- **Allocate training land uses**, including the type, frequency, duration and intensity of use, based on the capacity of the land to sustain those uses

[2] The core capability is the uniform land management level of performance, which is the basis for central HQDA ITAM resourcing within each installation category. Core capabilities refer to LCTA, TRI, LRAM, and EA tasks required for program execution at the HQDA, MACOM, installation levels, and supporting agencies (ATSC and AEC).

- **Support sustained use of land** by planning, programming, and executing repair and maintenance projects and by reconfiguring and redesigning training and testing areas to meet recognized requirements

- Educate users to **prevent avoidable damage** to the land and minimize unavoidable damage resulting from training, testing, and other mission activities

- **Establish a defined land condition baseline** for natural and cultural resources that will be maintained through ITAM and is relevant to the installation environmental setting and mission activity

- **Monitor land and natural resource conditions and determine trends** in those conditions

- **Stabilize and sustain natural and cultural resource conditions** by changing type, frequency, duration, or intensity of use, or by applying adjusted levels of repair and maintenance

- Educate environmental **and natural resources personnel** to improve understanding of Army **mission training requirements.**

1.6 ITAM Program Components

There are four components of ITAM. The**se four** components **work** in unison to accomplish the **ITAM** mission:

- Land Condition Trend Analysis (LCTA)

- Training Requirements Integration (TRI)

- Land Rehabilitation and Maintenance (LRAM)

- Environmental Awareness (EA).

LCTA is a management procedure that inventories and monitors land conditions. It incorporates relational database and Geographic Information System (GIS) technologies into the land use decision process**.** LCTA collects physical and biological resources data from training land in order to relate land conditions to training and testing activities. This data provides the information to effectively manage land use and natural and cultural resources.

TRI is a decision support procedure that integrates all requirements for land use with natural and cultural resources management processes.[3] TRI integrates the installation's training and testing requirements for land use derived from the Range and Training Land program (RTLP), range operations and training land management processes, and the installation training readiness requirements with the natural resource conditions of the installations lands. The Army Training and Testing Area Carrying Capacity (ATTACC) program is the standard ITAM methodology for estimating training land carrying capacity by relating training load, land condition, and land maintenance practices. The integration of all requirements occurs through continuous consultation among the Director of Plans, Training, and Mobilization (DPTM), natural and cultural resource managers, and other environmental staff members. The output of the TRI process shall be incorporated in the installation's Integrated Natural Resources Management Plan (INRMP).

LRAM is a preventive and corrective land rehabilitation and maintenance procedure that reduces the long-term impacts of training and testing on an installation. It mitigates training and testing effects by combining preventive and corrective land rehabilitation, repair, and/or maintenance practices. It includes training area redesign and/or reconfiguration to meet training requirements.

EA provides a means to educate land users on their environmental stewardship responsibilities. It provides for the development and distribution of educational materials to land users. These materials relate the principles of land stewardship and the practices of reducing training and/or testing impacts. It also includes information provided to environmental professionals concerning operational requirements.

Section four of this Department of the Army (DA) How-To Manual describes *how* each of the ITAM components contributes to projecting and sustaining a well-trained and equipped combatant force. It describes the relationship between the ITAM Program and the integration of environmental stewardship of natural and cultural resources, on lands under the control of the Army.

1.7 ITAM Program Funding

NOTE: Include a very brief discussion on ITAM in the TRM.

Similarly to other Army Programs, the Army intensively manages ITAM through functional channels to ensure that allocated resources are applied to support the training/operations mission, ITAM Program objectives, and core capabilities.

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[3] The INRMP is the Installation Commander' s comprehensive plan for deliberately managing natural resources. The purpose of the INRMP is to help attain and sustain stewardship requirements, while optimizing primary activities, i.e., execution of mission operations, on mission land, and where compatible conducting secondary activities such as commercial forestry, hunting and fishing.

HQDA centrally resources the ITAM Program through the Management Decision Package (MDEP) TATM[4]. TATM is a component of the Army's Operational Readiness (OPRED) program. Funds in MDEP TATM support the ITAM core capability across the Total Army. MDEP TATM includes funds programmed by appropriation, budget activity, program element, and Major Army Command (MACOM), which include:

- Operations and Maintenance, Army (OMA)
- Operations and Maintenance, Army Reserves (OMAR) for the United States Army Reserve Command (USARC)
- Operations and Maintenance, Army Reserve National Guard (OMARNG) for the Army Reserve National Guard (ARNG).

Research, Development, Test, and Evaluation (RDTE) funds support validated conservation-related environmental research when funded by the ITAM Program. ITAM funds will be obligated in the Army Management System Code/Program Element (AMSCO/PE) designated by the HQDA functional proponent.

As with other Army programs, funding levels depend on actual needs, national priorities, and availability. ITAM funding supports the ITAM mission, goals, objectives, and core capability and will not be used to accomplish any of the following:

- Correct statutory compliance requirements
- Perform routine range maintenance or modification, or Real Property Maintenance Account (RPMA) responsibilities
- Perform Army Conservation Program requirements, such as Planning Level Surveys (PLS)
- Reimbursable environmental research and development at the MACOM or installation level.

Installations identify their ITAM resource requirements through their annual workplan submission. As with other ITAM management procedures, the submission of budget requirements should be closely coordinated at the installation level, between the three key staff elements:

- The DPTM
- The natural and cultural resource management/environmental staff

[4] TATM is the **four-letter code for the ITAM MDEP.**

- Department of Public Works (DPW) elements.

MACOMs validate their installations' resource requirements. Similarly, at the MACOM level, ITAM related budget submissions should be reviewed jointly by the ODCSOPS, G3, or equivalent, the environmental staff, and the installation management staff, as applicable. MACOMs forward their validated resource requirements to the Executive Management Council (EMC).

At the HQDA level the EMC considers annual installation workplan submissions and prior year execution and formulates a recommendation to the Council of Colonels (COC) for the annual allocation of funds.

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2.0 ITAM PROGRAM MANAGEMENT

Section two of the DA HOW-TO MANUAL 350-4 describes ITAM Program-wide management roles, responsibilities, and mechanisms. Most of the information in this section is meant to inform the installations about ITAM Program management activities that affect individual installations. This section will

- Identify the organizations participating in the management of the ITAM Program
- Provide an overview of ITAM funding principles
- Describe the factors affecting an installations priority category
- Define the ITAM Program measures of effectiveness
- Describe the main communication mechanisms supporting ITAM.

2.1 Roles and Responsibilities

ITAM Program management includes four agencies and the Major Army Commands Heaquarters (HQ) levels. The four agencies performing executive ITAM Program management for the DA are as follows:

- The Training Directorate, ODCSOPS (DAMO-TR)
- The Environmental Readiness Division, Office of the Directorate of Environmental Programs (ODEP), Office of the Assistant Chief of Staff Installation Management (OACSIM)
- The Army Training Support Center (ATSC), Training and Doctrine Command (TRADOC)
- The Conservation Branch, US Army Environmental Center (USAEC).

ITAM Program management also involves the COC, EMC, and ITAM Installation Steering Committee (IISC). The Configuration Control Board (CCB) provides management oversight to ITAM technological requirements identification, development, and implementation. Additionally, the Plans Division, Facilities and Housing Directorate, and Office of the Assistant Chief of Staff for Installation Management, HQDA, provides the policy link to the Army's overall real property management program.

Figure 2-1 illustrates the general support structure of those organizations providing ITAM Program management.

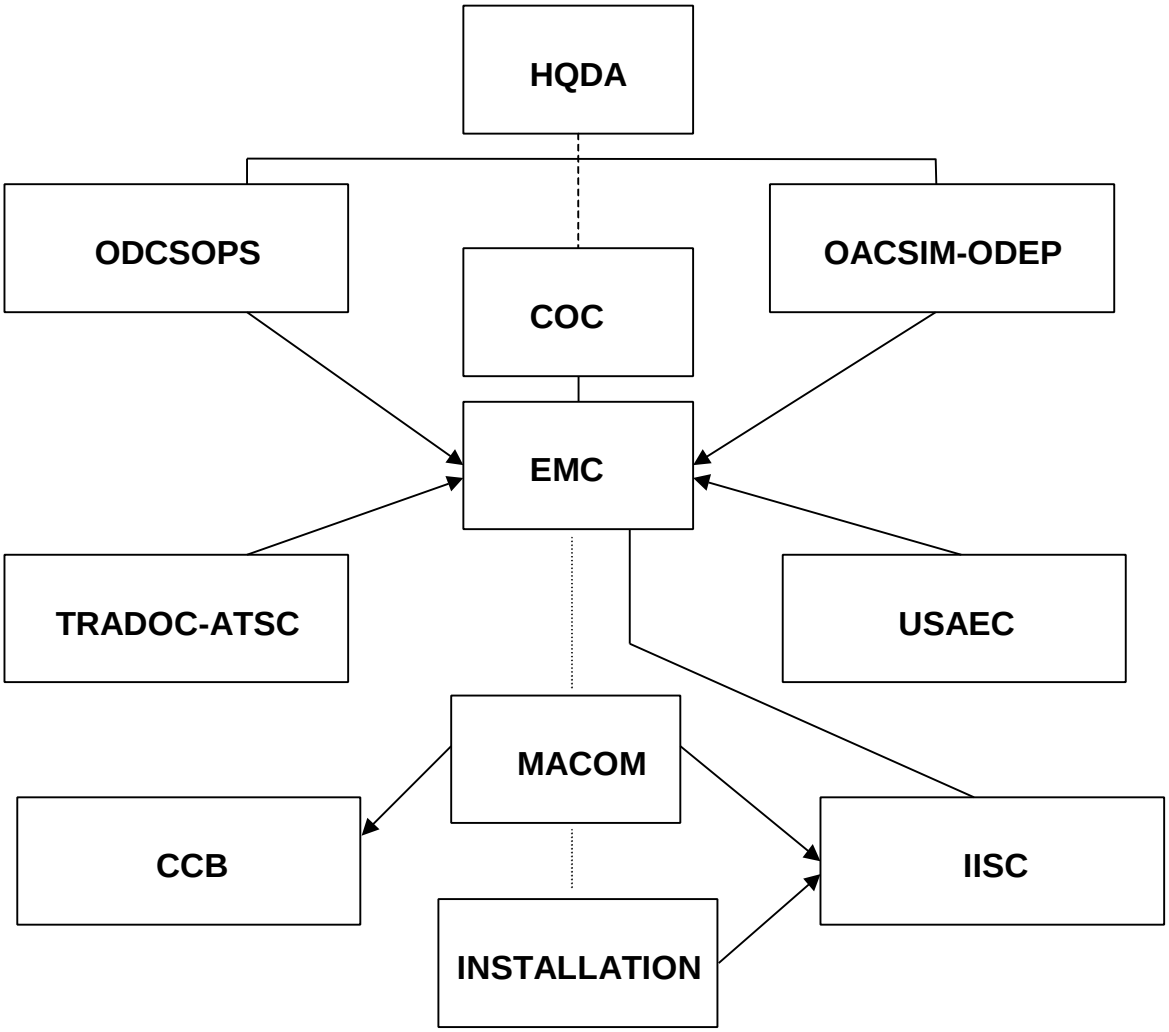

Figure 2-1. ITAM Program Management.

Table 2-1 lists each organization along with a brief description of their major roles. The remainder of section 2.1 provides a detailed description of the roles and responsibilities for each organization included in table 2-1.

Table 2-1 ITAM Management Roles and Responsibilities.

Organization	Roles
ODCSOPS, DAMO-TRS	HQDA functional proponent with overall ITAM Program responsibility Develops, provides, and integrates ITAM Program policy Funds ITAM Program
OACSIM-ODEP	Develops and provides conservation policy in support of the ITAM Program
COC	Provides executive-level ITAM Program oversight Approves policy and support requirements Makes recommendations to the Director of Training, as required
EMC	Represents the Council of Colonels at the action officer level Conducts PMRs Makes recommendations to the COC
TRADOC-ATSC	Executive Agent, ITAM and combat training developer Focuses on user requirements, staff support of policy formulation, and training support to MACOMs and installations
USAEC	Provides and manages environmental technical support
MACOM	Develops, provides, and integrates ITAM Program policy to subordinate installations, provides management oversight, represents installations' needs to executive ITAM Program management organizations
IISC	Plans and executes the ITAM Annual Workshop Conveys installation-level input for achieving improvements to the ITAM Program
CCB	Provides management oversight to ITAM technological requirements identification, development, and implementation
Installations	Links the efforts of the DPTM, who has responsibility for installation training land management, with the efforts of the DPW and the natural and cultural resources/environmental staffs to support the overall objectives of sustaining a well-trained and equipped combat force

2.1.1 ODCSOPS: ITAM HQDA Functional Proponent

As the HQDA functional proponent, the ODCSOPS has overall responsibility for the ITAM Program with specific responsibility residing within the Training Simulations Division (DAMO-TRS). ODCSOPS issues policy, allocates resources, and oversees execution of ITAM DAMO-TRS and is responsible for the following:

- Establishing ITAM policy
- Integrating ITAM policy with other Army training policy
- Providing budgets and programs, approving new program requirements
- Coordinating ITAM within the Army Staff, Army Secretariat, Office of the Secretary of Defense (OSD), and Departments of the Navy and Air Force.
- Serving as the HQDA functional proponent for ITAM
- Providing HQDA supervision, direction, and management oversight of ITAM, ensuring a sustained and uniform ITAM capability that reflects readiness priorities
- Formulating Army policy and issue administrative programmatic guidance and instructions for implementing and sustaining ITAM
- Coordinating ITAM policy to preclude conflicts and to synchronize activities among the operations and training, natural and cultural resources management, and environmental and real property management and master planning activities
- Justifying and providing funding in accordance with the Planning, Programming, Budgeting and Execution System (PPBES), for Army-wide implementation of ITAM and as a component of the OPRED Program
- Providing the chairperson of the EMC
- Designating the Chief of the Training Simulations Division as the chairperson of the ITAM COC
- As recommended by the COC, approving actions that affect ITAM Program policy, procedures, requirements, priorities, and budget and program submissions
- Coordinating matters impacting and/or relating to ITAM within the Army Staff (ARSTAF), the Army Secretariat, OSD, Joint Staff (JS), and Departments of the Navy and Air Force.

2.1.2 OACSIM-ODEP

The Director ODEP, OACSIM or a designated representative serves as a voting member of the ITAM COC. The Directorate of Environmental Programs (DEP), OACSIM, is responsible for and provides Army conservation policy. The DEP is responsible for the following:

- Monitoring ITAM development and execution for consistency with Army conservation policy and providing recommendations to the functional proponent
- Incorporating ITAM goals, objectives, and requirements in Army conservation policy as appropriate
- Integrating conservation data management requirements with those of ITAM
- Providing a member to the EMC and participating in the ITAM Program Management Review (PMR) process
- Incorporating ITAM requirements into the Conservation Research and Development (R&D) Program through the Environmental Quality Technology (EQT) process
- Providing guidance to the US Army Environmental Center (USAEC) regarding environmental technical support for the ITAM Program.

2.1.3 Council of Colonels (COC)

The COC is the executive level ITAM management cell. The COC consists of the Director, ODEP, OACSIM and the Commanders of USAEC and ATSC, or their designated representatives. The Chief of Training Simulations Division, ODCSOPS chairs the COC.

The COC is responsible for the following:

- Conducting semi-annual meetings following each Program Management Review (PMR)
- Providing executive-level ITAM Program oversight
- Approving policy and technical and training support requirements
- Acting on the recommendations of the EMC or addressing recommendations to the Director of Training as required.

The COC meetings are also attended by non-voting representatives from OACSIM-MD, Directorates of Research and Development and Military Programs, USACE, and other agencies supporting ITAM.

2.1.4 Executive Management Council (EMC)

The EMC is a four-member panel chaired by the Training Simulations Division, ODCSOPS and represents the action officer level. The EMC consists of representatives from the Training Simulations Division, ODCSOPS; Directorate of Environmental Programs, OACSIM; Combat Training Support Directorate, TRADOC; and the Conservation Branch, Environmental Quality Division, Army Environmental Center.

The EMC meets on a quarterly basis or more frequently, as needed. The specific responsibilities of the EMC are as follows:

- Conducting semi-annual PMRs
- Reviewing and validating actions resulting from the PMRs
- Making recommendations to the COC on actions affecting ITAM Program policy, resourcing, technical support, research and development, or execution
- Managing the ITAM Program to implement validated user requirements
- Validating actions of the IISC

2.1.5 TRADOC-ATSC: ITAM Executive Agent/Training Development and Support

The Deputy Chief of Staff for Training (DCST), Headquarters (HQ) TRADOC under the guidance of the HQDA functional proponent through the ITAM COC is the executive agent for the ITAM Program. To carry out this responsibility, the ATSC or a designated representative, will:

- Serve as a voting member of the ITAM COC
- Develop and document ITAM user requirements
- Integrate ITAM requirements with other Army existing or developmental automated training and training management systems and programs, notably the RTLP and the Real Property and Master Planning (RPMP) programs
- Provide and monitor validated user requirements to the Conservation Branch, Environmental Compliance Division, USAEC
- Assess ITAM user requirements for their implications for overall Army training, range/training land doctrine, and programs
- Provide ITAM training support to HQDA, MACOMs, and installations

- Develop and submit to the COC an annual workplan for requirements associated with executive agent responsibilities

- Serve as a member of the EMC and advise the HQDA functional proponent on ITAM user requirements

- Organize and host the semi-annual PMR

- Participate in the PMR process

- Serve as a non-voting liaison to the IISC

- Synchronize and coordinate ITAM policies and procedures with other related processes and programs to provide a sound business foundation and fiscally prudent synchronization of Army wide activities and initiatives, most notably the RTLP process and RPMP programs

- Integrate ITAM policies and procedures with relevant activities under the purview of, or promulgated by the Chief of Engineers (COE), and the US Army Corps of Engineers (USACE)

- Chairs the CCB for the ITAM Geographic Information Systems (GIS) user requirements.

2.1.6 USAEC: Environmental Technical Support

The US Army Environmental Center, under the guidance of the Directorate of Environmental Programs (DEP), OACSIM, and the HQDA functional proponent through the ITAM COC, is responsible for providing and managing environmental technical support for the ITAM Program. To carry out this responsibility the USAEC will:

- Provide a designated representative to serve as a voting member of the ITAM COC

- Develop environmental technical support that reflects the environmental technology applications and resources required to fulfill validated environmental user requirements

- Provide environmental technical support to HQDA, MACOMs, and installations, based on approved requirements, as resourced by the HQDA functional proponent

- Establish and maintain the Army-wide personnel training program for operations and training, natural and cultural resources, and environmental management personnel involved in the ITAM Program

- In cooperation with the executive agent, coordinate with technology developers to review, prioritize, design, develop, test, and/or validate the capabilities of new and/or existing environmental technologies applicable to ITAM

- Provide HQDA, MACOMs, and installations with an efficient and standard means to obtain core capabilities and environmental technical support

- Develop and submit to the COC an annual workplan for requirements associated with environmental technical support for the ITAM Program

- Serve as a member of the EMC and recommend to the COC the type and level of environmental technical support and conservation related research and development needed to satisfy ITAM user requirements

- Participate in the PMR process

- Serve as a non-voting liaison to the IISC

- Direct coordination is authorized between the HQDA functional proponent and USAEC for all functions specified above with information provided to the DEP.

2.1.7 Major Army Command (MACOM)

MACOM ITAM responsibilities include but are not limited to:

- Developing MACOM ITAM policy

- Providing ITAM Program oversight for subordinate installations

- Allocating resources to implement and sustain installation ITAM Programs

- Reviewing and validating installation workplans

- Preparing and submitting annual workplans for MACOM HQ ITAM requirements

- Participating in the DA PMR representing both the MACOM and subordinate installations

- Based on installation ITAM needs, identify ITAM user requirements to the Combat Training Support Directorate (CTSD), United States Army Training Support Center (USATSC)

- Maintain program coordination with MACOM environmental and installation management staff

- Assisting installation ITAM staffs in program execution

- Providing input to the Installation Status Report (ISR) regarding training and testing land conditions.

The MACOM environmental staff supports ITAM by providing environmental technical support and participating in the semi-annual PMR. The MACOM ODCSOPS, or equivalent, maintains a functional relationship with the MACOM environmental and installation management staffs to effectively implement and sustain the program.

Table 2-2 defines the MACOM HQ ITAM responsibilities.

Table 2-2. MACOM HQ ITAM Roles.

MACOM	ITAM RESPONSIBILITY
Forces Command (FORSCOM) US Army, Pacific (USARPAC) US Military Academy (USMA) US Army Reserve Command (USARC) Military District of Washington (MDW)	ODCSOPS
Training and Doctrine Command (TRADOC)	DCST
US Army Europe (USAREUR)	Assistant Deputy Chief of Staff, Operations and Plans (ADCSOPS)-T
National Guard Bureau, Operations, Training, & Readiness Division Office (NGB-ARO)	Operations, Training and Readiness Division
Eighth US Army (EUSA)	Assistant Chief of Staff, G3 (ACS-G3)
US Army Medical Command (MEDCOM)	Director of Plans, Training, Mobilization & Security (DPTMSEC), Fort Sam Houston
Army Materiel Command (AMC), primarily the Test and Evaluation Command (TECOM)	Installations and Services Activity (ISA)

2.1.8 ITAM Installation Steering Committee (IISC)

The ITAM Installation Steering Committee (IISC) functions under a letter of instruction (LOI) published by the HQDA ODCSOPS. Appendix D provides the LOI sanctioning the IISC.

The primary responsibility of the IISC is to plan and execute the ITAM Annual Workshop. **The committee announces a call for new committee members at the annual workshop and via the ITAM website.** In addition, the IISC provides valuable installation-level input for achieving improvements to the ITAM Program. The IISC

includes voting and nonvoting members; one member serves as the chairperson and one as the vice-chair. The voting members include representatives from ten installations, two MACOMs, and one Army Corps of Engineers laboratory. Representatives from USATSC and USAEC act as nonvoting members.

The ten installation members should equitably represent the four components of the ITAM Program and the MACOMs having ITAM Programs. All members of the IISC must be willing and able to make a serious commitment to actively participate in the planning and support of the ITAM Annual Workshop, as this responsibility is in addition to their normal duties.

Voting members serve a four-year term. The chairperson and vice-chairperson term of office is one year. Each year at the annual workshop, the committee elects a new vice-chairperson and the existing vice-chair replaces the chairperson. In addition, three voting members retire from the committee each year. Based on that rotation, the entire voting membership of the IISC turns over every fourth year.

Installation DPTM or the MACOM G3 (or equivalent) must approve a member volunteering or nominated for IISC membership. Once a nomination is approved, installations will pass nominations through their MACOM to the IISC chairperson. If an existing member resigns, the voting members of the IISC nominate a new member to fill the vacancy. If the nominated individual's installation DPTM or the MACOM G3 approves the action, the newly elected member serves the remainder of the resigned member's term. A representative from the installation hosting the annual DA ITAM Workshop is designated as one of the new IISC members each year; **the representative from the host installation is identified one year before the annual workshop occurs at their installation.** The USATSC and USAEC members are appointed by their respective agencies and serve terms as determined by those agencies.

The IISC is ultimately responsible for planning and executing the ITAM Annual Workshop. The IISC chairperson has lead responsibility for the following:

- planning the workshop with input from all committee members.
- providing workshop information to the Chief Conservation Officer for the Navy, Air Force, and Marine Corps; and requests their endorsement to their respective commands and installations.
- coordinating information regarding the workshop with the ITAM Project Officer in DAMO-TRS for official endorsement of the workshop to Army MACOMs and agencies.

The vice-chairperson is responsible for:

- assisting the chairperson with correspondence and planning

- learning the process for the next workshop when he/she becomes the chairperson.

The committee announces a call for papers to all military services, Army MACOMs, individuals who have attended previous workshops, and individuals expressing an interest in the workshop. Workshop topics, individual presentations, site information, selected dates for future workshops, and committee members are issues decided by voting committee members. Either voting or nonvoting members may submit topics for discussion. A simple majority determines issues requiring a vote. The nonvoting USATSC and USAEC members nominate topics originating from the ITAM PMR and/or ITAM COC.

All committee actions must conform to the Army's ITAM Program management structure. Put simply, the IISC does not replace the chain of command. As such, the IISC has no authority over installations outside the formal chain of command; (i.e., HQDA to MACOM HQ; and MACOM HQ to installations. All actions of the IISC must be validated by the ITAM EMC and approved by the COC.

2.1.9 Configuration Control Board (CCB)

The Configuration Control Board (CCB) is part of the ITAM Technology Configuration Management (TCM) process defined in Appendix E. The TCM process, which is an extension of the PMR process, provides a fair and efficient mechanism of integrating technology into the ITAM Program and takes advantage of the extensive technical and functional expertise available at installations and MACOMs.

The CCB, which includes MACOM representatives, provides management oversight to ITAM technological requirements identification, development, and implementation. The CCB through the ITAM TCM process is responsible for supporting the following:

- Identifying and/or validating ITAM user requirements having technological implications
- Evaluating existing commercial or government products and services that may address these requirements
- Overseeing development of technological products and services
- Identifying and recommending priorities for technology fielding requirements
- Identifying and recommending priorities for resourcing technology requirements
- Recommending general management guidance and direction to the ITAM Program on technology issues.

2.1.10 Installations

At the installations, ITAM Program execution is the responsibility of the installation DPTM, G3, or equivalent. Through ITAM, the DPTM's training land management **responsibilities are linked** with the DPW and the natural and cultural resources staffs. The objective of sustaining well-trained combat forces **is met through these individual's synergistic interactions**. Section three provides a more detailed description of the ITAM Program-related roles and responsibilities at the ITAM installations.

2.2 Program Funding

The ITAM Management Decision Package (MDEP) is TATM and it funds the ITAM core capabilities, which are the LCTA, TRI, LRAM, and EA tasks required for program execution at the HQDA, MACOM, installations, and supporting agencies. (i.e., the USATSC and USAEC.)

Funding is subject to Army management decisions relating to affordability. The ITAM Program core capability is managed by the HQDA proponent (DAMO-TRS) within the Training Program Execution Group (TTPEG). The TTPEG is chaired by the Director of Training (DOT), ODCSOPS, and the Deputy Assistant Secretary of the Army (Reserve Affairs, Readiness, and Mobilization Training).

ITAM funding is not intended to address or correct statutory compliance or conservation requirements. These requirements continue to be funded through the Army Environmental Compliance Program (MDEP VENC) and Army Conservation Program (MDEP VENN), which are managed within the ITAM Installation (II) Program Execution Group (PEG) and chaired by the OACSIM.[5] ITAM core capability resources are not intended to be used to perform routine range maintenance. Instead, these requirements are funded through MDEP VSCW, Training Range Operations.[6] Lastly, ITAM funding is not intended to replace normal base operations activities on training lands normally funded by the Real Property Maintenance Account (RPMA).

The HQDA functional proponent prepares an Annual Program Plan (APP) by aggregating annual workplans and reflecting MACOM validated installation ITAM requirements and funding levels. The APP identifies Army Management System (AMS) codes and program elements (PE) used in TATM. Figure 2-2 provides an overview of the process for developing the APP. Section 3.4 provides a detailed description for developing installation annual workplans.

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[5] VENC is the four-letter code for the Environmental Compliance MDEP, VENN is the four letter code for the Army Consrvation MDEP.

[6] VSCW is the four-letter code for the Training Range Operations MDEP.

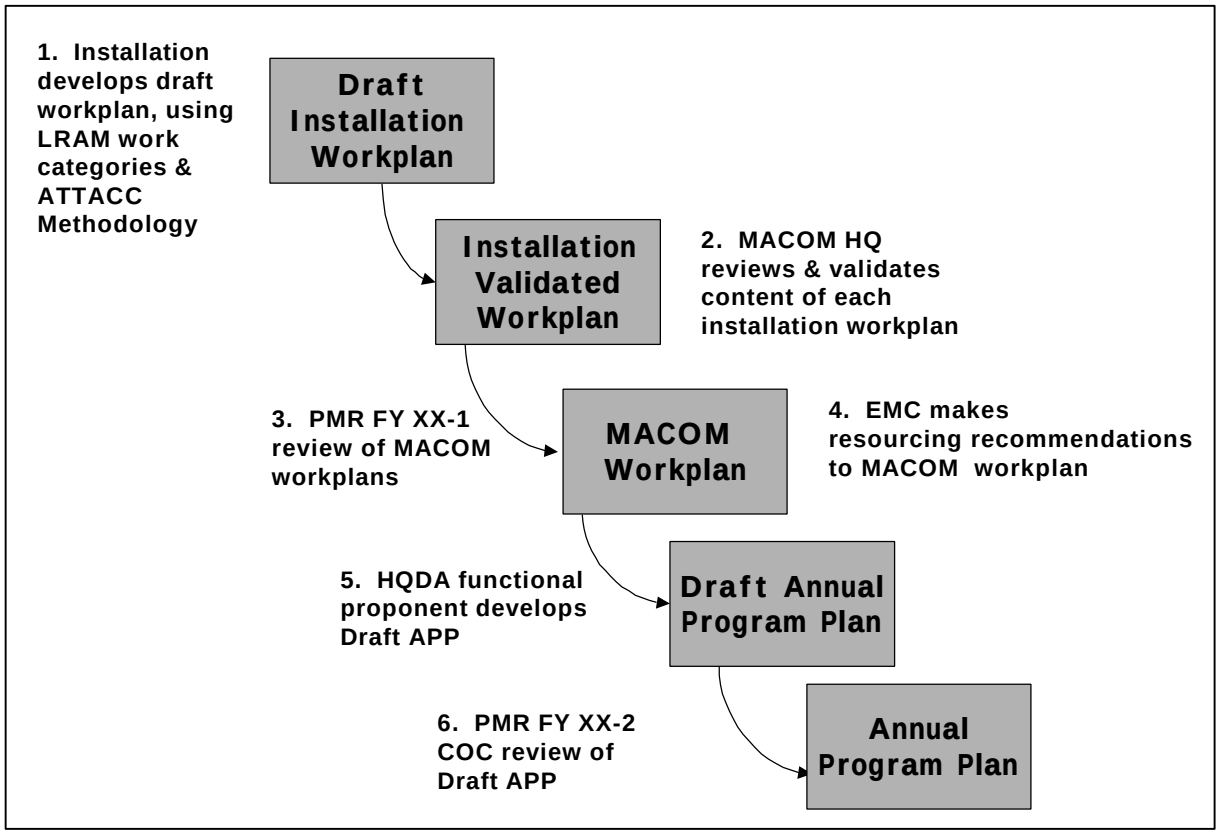

Figure 2-2. The Steps to Develop the ITAM Annual Program Plan.

Installation validated workplans are the starting point for development of the ITAM APP.[7] Validated installation workplans are forwarded to the MACOM HQ in accordance with (IAW) MACOM procedures and suspense dates. Appendix F provides an example of an installation workplan.

The PMR process, described in section 2.5, is the forum by which MACOMs present their total ITAM requirements using installation-validated workplans. The PMR provides an opportunity for discussion between the MACOM representatives and the ITAM Executive Management Council (EMC). The PMR discussions seek to achieve consistency and standardization in installation ITAM Programs across MACOMs. The EMC will not normally overrule the MACOM validation process or decisions.

Based on the PMR discussions, the EMC formulates a resourcing recommendation that serves as the basis for a draft Annual Program Plan (APP). The draft APP, developed by DAMO-TRS, is presented to the ITAM Council of Colonels (COC) at their summer meeting.

[7] Section three provides a detailed description of the process for developing installation level workplans.

The COC approves the recommended draft APP and/or provides guidance resulting in adjustments to that plan. The APP approved by the COC serves as the basis for funding to MACOMs and other agencies for the next fiscal year (FY) and for development of Program Operations Memoranda (POM) submissions.

2.3 Prioritizing Installations for ITAM

Installations are scored and placed into prioritized categories to assure a consistent program capability across the total Army. The method of scoring and prioritizing installations is established by the HQDA functional proponent through the PMR process. As required, the EMC recommends to the COC new scoring methods, criteria, and categories for approval.

The MACOMs identify the installations having a significant testing or training and testing mission land use. The MACOM calculates a score for an installation by applying discriminators, such as training mission, installation size, and level of environmental sensitivity, based on the standard criteria provided by the HQDA functional proponent. To ensure accuracy of scores, MACOMs consult with installation commanders and annually review and revise installation scores to reflect changed conditions.

The HQDA functional proponent assigns installations to categories based on the overall score provided by its MACOM and the interrelationship of the scoring factors. Assignment of installations to categories is reviewed annually. The HQDA functional proponent applies the scores and categories to determine relative installation priorities for resourcing.

2.4 Installation Categories

Four categories establish the relative importance of land management requirements among ITAM installations. The association of an ITAM installation with a specific category is based on the mission, training load and training intensity, installation size, and environmental sensitivity to mission activity factors. Category I (CAT I) installations have the highest priority and therefore receive the highest level of ITAM funding, followed by Categories II-IV (CAT II–IV), respectively.

The four installation categories are as follows:

- CATEGORY I: Installations with the most critical training and testing mission, and with greatest environmental sensitivity to missions
- CATEGORY II: Installations with important training and testing missions and significant environmental sensitivities to missions
- CATEGORY III: Installations with training and testing missions, and some environmental sensitivity to missions

- CATEGORY IV: Installations with training and testing missions, and minimal environmental sensitivity to missions.

2.5 Requirements

Civil Service and military workforce are not normally considered part of the ITAM core capability. MDEP TATM funds supplemental staffing, as indicated in Table 2-3, to perform ITAM core tasks. The following four functions, align with the ITAM core capability (supplemental staffing):

- ITAM Coordination/Management Support
- LCTA Coordination/Management Support
- Geographic Information System (GIS) and/or Database Management
- LRAM Coordination/Management Support

Table 2-3: ITAM Supplemental Staffing Function.

Staffing Element	Category I	Category II	Category III	Category IV
ITAM Coordinator	X	X	X	X
LCTA Coordinator	X	X		
GIS/Database Management	X	X	X	
LRAM Coordinator	X	PT*		

* Part-time

MDEP TATM funds support supplemental staffing requirements, based on the relative importance of an installation's training and testing mission and land management requirements.

As part of the ITAM Program core capability, MDEP TATM provides resources to assist and support both the natural and cultural resources management/environmental and range management staff. MDEP TATM funds will resource supplemental workforce intended to perform the tasks required to support the four ITAM Program components. This supplemental staffing capability in no way detracts from the ITAM Program management responsibility of the DPTM or from the oversight of the natural and cultural resource management and/or environmental staff.

The Army's Environmental Conservation and Compliance Programs; that is MDEP VENN and VENC, provide the resources for the natural and cultural resource

management and/or environmental workforce needs. MACOM and installation natural and cultural resource management and/or environmental staff perform environmental technical functions, including those that support ITAM.

MDEP VSCW (or RL02 for Army Materiel Command (AMC) test locations) provides the resources for Civil Service and Local National (LN) workforce for range and training land management. Range managers perform all installation range management functions, including those that support ITAM.

2.6 Research and Development (R&D) Requirements

ITAM research and development (R&D) requirements are based on user requirements refined by the Conservation Branch, USAEC in conjunction with the Combat Training Support Directorate, TRADOC. After validation by the EMC and approval by the COC, the Conservation Branch presents conservation related R&D requirements to the ODEP for consideration during the requirement development portion of the Environmental Quality Technology (EQT) Process. Members of the EMC may participate in conservation R&D reviews to monitor progress of ITAM related issues.

2.7 ITAM Program Measures of Effectiveness

The ITAM Program is an innovative approach that focuses on improving the performance and sustainability of military operations while simultaneously weaving environmental protection into daily military training and testing mission. As with all Government funded programs, quantitative evidence of ITAM's value to the training and testing mission helps to assure long-term and adequate funding. Table 2-4 lists the ITAM Measures of Effectiveness by which the HQDA functional proponent will evaluate program success.

Table 2-4. Measures of Effectiveness.

MEASURES OF EFFECTIVENESS
Execute Program at a minimum of 100% of the allocated funding
Sustain or increase land (acreage) available to support training and testing
Provide doctrinally sound land parcels to support mission training and testing
Demonstrate through workplans, direct correlation between ITAM projects and installation training and testing mission/activities
Show downward trend in notices of violations resulting from training and

MEASURES OF EFFECTIVENESS
testing
Maintain a balance of training load and ecological health of land through the Army Training and Testing Area Carrying Capacity (ATTACC) methodology

2.8 Program Management Mechanisms

The Army has four formal mechanisms to enable ITAM Program management decisions, communication, and efficient dissemination of information regarding the ITAM Program. **These mechanisms are explained in further detail in the following sections.**

The four mechanisms include the following:

- Program Management Reviews
- A quarterly newsletter called “The Bridge”
- The ITAM website
- The annual ITAM Workshop.

2.8.1 Program Management Reviews (PMRs)

The PMR process is the forum by which MACOMs present their total ITAM requirements using installation validated workplans. The PMR provides an opportunity for discussion between the MACOM representatives and the ITAM EMC. The PMR discussions seek to achieve consistency and standardization in installation ITAM Programs across MACOMs. The EMC will not normally overrule the MACOM validation process or decisions.

The ITAM executive agent hosts PMRs on a semi-annual basis; the semi-annual PMRs are identified as PMR FY XX-1 and PMR FY XX-2. The HQDA functional proponent chairs the PMRs.

The PMR FY XX-1 takes place at USATSC. The purpose of PMR FY XX-1 is to conduct the following:

- Review user requirements status and propose additional user requirements
- Discuss budget submission and user requirements through review of the annual workplan submissions

- Develop a recommended APP for COC approval in support of the Army Budget submission for the following Fall

- Discuss ITAM Program initiatives and projects having Army-wide impact.

Based on the PMR discussions, the EMC formulates a resourcing recommendation that serves as the basis for a draft APP.

The PMR FY XX-2 is held in conjunction with the annual DA ITAM Workshop at sites located throughout the Continental United States (CONUS). The intent of the PMR FY XX-2 is to confirm the APP, as approved by the COC; and to discuss and validate technology initiatives and projects having Army-wide ITAM impact.

The possible actions from a PMR are described below:

- **Program Policy and Procedures Adjustment.** The EMC coordinates and makes recommendations to the COC. Once approved, change is made through appropriate action (e.g., policy memo, policy message, LOI)

- **Environmental Technical Support Requirement**. The USAEC Conservation Branch coordinates support, technical studies, consultation, training material, and facilitation of day-to-day technical support of ITAM components (i.e., LCTA, TRI, LRAM, and EA)

- **Training Technical Support Requirement.** The USATSC-CTS coordinates support, assesses training readiness implications to the Army land doctrine, and facilitates day-to-day technical training support of ITAM TRI components.

2.8.2 ITAM Quarterly Newsletter

"The Bridge", is an official U.S. Army publication, and is a means by which ITAM personnel can share information about trends, events, and current thoughts related to the Army's ITAM Program. Installation success in the ITAM Program depends on the use of best management practices, many of which are recommendations by other installations. It is therefore important that installations prepare and submit articles on initiatives, unique solutions, and other "how-to" topics used as part of the ITAM Program.

Anyone participating in the ITAM Program may submit an article with or without photographs or graphics to the editor of "The Bridge." All items must have MACOM-approval before publication in the newsletter.

The submission deadlines for "The Bridge" are included in each issue and are also on the ITAM website. Each issue of "The Bridge" provides the name, mailing and electronic mail (email) addresses, and deadlines for submissions. Unless articles appearing in "The Bridge" are copyrighted, they may be reproduced and shared.

2.8.3 ITAM Website

The USAEC provides the ITAM website in support of the ITAM Program. The ITAM website is the official means for obtaining the most current ITAM information, such as official policy, miscellaneous publications, and ITAM personnel telephone and email addresses. All information on this site is unclassified and accessible by the public via the internet. Everything on the site may be distributed and reproduced.

The USAEC maintains the ITAM website. Maintenance includes adding new features, links to other websites, and updating, adding, or deleting content. Anyone may request an update to the website. However, the USAEC, under the guidance of the EMC, reserves the right to accept or reject submissions.

To request an update to the ITAM website, send an email to the ITAM webmaster via the email address provided on the site. **The website can be accessed at http:\\www.army-itam.com.**

2.8.4 Annual ITAM Workshop

The annual ITAM workshop supports the Army's ITAM Program by providing a forum to reinforce the Army's ITAM policies and procedures and improve land management capabilities. The workshop promotes best conservation and training/testing land management practices by facilitating exchange of scientific research **and program successes**. It advances land management, provides input on requirements and emerging/proven technologies applicable to ITAM, if requested by the ITAM COC. The most important benefits of the annual ITAM Workshop are the ideas, experiences, and lessons learned shared between ITAM Program participants. This is an ideal efficient means to advance the ITAM Program and to integrate ITAM with three other critical Army programs: Conservation, master planning, and RTLP.

Planning of the ITAM Workship is the responsibility of the IISC chairperson with input from all IISC members and support of the vice-chairman. **Host installations are chosen through the IISC.**

Installations desiring to host the annual ITAM Workshop will submit a proposal a package and a letter of support signed by their Garrison Commander through their MACOM to the IISC Chairperson.

The host installation is responsible for the following:

- Planning, organizing, and conducting all aspects of the workshop except for those IISC responsibilities listed below
- Coordinating lodging and scheduling meeting facilities
- Conducting the program, including coordination of audio visual equipment, operating lights, and coordinating breaks

- **Planning and** conducting a field tour
- Providing all transportation necessary for the field tour and to move people between lodging and meeting facilities
- Conducting pre- and on-site registration, including developing and sending pre-registration packets, collecting fees necessary to defray the cost of the workshop, sending out the Call for Papers, and completing the attendee address list
- Identifying ITAM Workshop requirements in the annual ITAM Workplan
- Hosting the March/April IISC Meeting
- Assigning an ITAM representative to serve on the IISC. Terms begin one year prior to the workshop and continues for three years following.

For detailed information on the annual ITAM Workshop, see the LOI in Appendix D.

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3.0 Installation ITAM Program Management

Section 3 describes **implementation of the** ITAM **Program** on Army installations. It includes standard procedures and guidance for the successful management and execution of the ITAM components. The management responsibilities outlined in this chapter are consistent with AR 350-4. Variations to this management structure may exist at installations due to command preference; resourcing or workforce shortfalls, local conditions, or category of the installation as scored by the MACOM and approved by DA.

3.1 Installation-level ITAM Program Management Roles and Responsibilities

NOTES:

- **Chapter 3/4 needs to have the term "core capabilities" as part of "what is ITAM and what does it include".**
- **We also need to bring the ITAM categories from Chap 2 "to life" by explaining at the installation level. (So I'm a Cat II – what does that mean?).**

NOTE: Decide who coordinates with the GIS RSC and include this responsibility under their section.

Executing an effective ITAM program is the responsibility of the installation DPTM, G3, or equivalent. The ITAM program provides a vital link between the DPTM who has responsibility for installation training land management, the DPW, and the natural and cultural resources/environmental staffs.

3.1.1 DPTM, G3, or Equivalent

The DPTM, G3, or equivalent on an installation executes the ITAM program by providing management and coordination capabilities to include:

- Establishing installation ITAM policy and program priorities
- Overseeing ITAM program funding to include submission of the annual workplan
- Coordinating ITAM program matters with the installation environmental offices and other installation staff directors, as applicable
- Providing input/reports to the MACOM HQ
- Providing for the overall program management and direction for the four ITAM components (i.e., LCTA, LRAM, TRI, and EA)
- Ensuring execution of resources to meet ITAM objectives.

3.1.2 ITAM Coordinator

The ITAM coordinator manages and resources the four components of the ITAM Program, develops the multi-year installation-level ITAM workplan, and coordinates the plan with the installation staff. The ITAM coordinator also establishes forums, procedures, and mechanisms for ITAM coordination and information and product exchange among DPTM, natural and cultural resource management, environmental, DPW, and other involved organizations, agencies, and staff. The ITAM coordinator performs specific tasks that include, but are not limited to:

- Recommending ITAM policy to the DPTM
- Managing and coordinating the daily activities of the four components of the ITAM Program
- Developing the installation ITAM annual workplan for submission to MACOM
- Based on annual funding, recommending project priorities and resourcing allocations to the DPTM
- Submitting technical support requests and users requirements to the MACOM
- Developing an installation ITAM 5 year plan which is coordinated and consistent with the installation master plan, the RTLP, the INRMP, the Integrated Cultural Resources Management Plan (ICRMP), and the Endangered Species Management Plan (ESMP), if appropriate
- Providing land use recommendations to the DPTM
- Providing land condition status reports with appropriate recommendations to the installations staff
- Ensuring environmental awareness programs are developed for all installation land users
- Ensuring the GIS database supports the requirements of installation **training land managers and** land users
- **Integrating the environmental database into the ITAM GIS system**
- Ensuring execution of annual funding IAW approved project priorities
- Coordinating, collecting, and reporting the performance measurement data to MACOMs IAW MACOM procedures and suspense dates

- **Serving as communication/coordination link between the DPTM and wildland fire management of natural resources and DPW, under the responsibility of the installation Fire Marshall**

- **Working with the LRAM coordinator to evaluate the effectiveness of prescribed solutions after an LRAM project is complete**

- **Annually evaluating the success of the ITAM Program**.

3.1.3 Land Condition Trend Analysis (LCTA) Coordinator

The LCTA Coordinator is responsible for the LCTA component of the ITAM Program. Duties of the LCTA coordinator include, but are not limited to:

- Recommending protocols, procedures, technologies, and methodologies for gathering data and assessing the condition of natural and cultural resources on the installation

- Maintaining an installation **LCTA** baseline database needed to support training land management

- Monitoring for trends to the training land condition, analyzing trend information, and making appropriate recommendations for management actions

- Identifying and recommending priorities for land repair based on training and testing impacts and LCTA data analysis

- Supervising the activities of the installation field data gathering crews

- Coordinate the **LCTA** baseline data and subsequent data collection with execution of PLSs

- Assessing the effectiveness of methodologies being used to gather and analyze natural and cultural resource data in meeting the needs of the training land management and environmental/natural and cultural resources management staffs

- Working with the natural and cultural resources staff, **or the appropriate installation staff managing these programs,** to acquire the necessary data to support ITAM analysis and trend determination predictions, **and ITAM data layers**

- **Assist ITAM coordinator in developing the LCTA portion of the installation in the ITAM long-range plan**

- Reporting data, findings, and progress to the ITAM coordinator.

3.1.4 Geographic Information System (GIS) and Database Management Specialist

The ITAM GIS **specialist** is responsible for the following:

- Ensuring data security and that data and metadata are maintained to Federal Geographic Data Committee (FGDC) and TRI Services Spatial Data Standards (TSSDS) standards
- Working closely with the ITAM and LCTA coordinators to ensure an understanding of their requirements
- Obtaining, digitizing, and maintaining current spatial data layers and relational databases (Appendix I provides the core and optional GIS data layers)
- Producing cartographic products for use by the training land management and natural and cultural resources management staffs, and other installation training land users
- **Providing** GIS databases **that meet** LCTA **and LRAM** analytical requirements
- Ensuring that the spatial data layers support RTLP management requirements and are available for incorporation into Range and Training Land Program Automated Systems (RTLP-AS).

3.1.5 Land Rehabilitation and Maintenance (LRAM) Coordinator

The duties of the LRAM Coordinator include, but are not limited to:

- **Determining the needs of** range operators, managers, trainers, etc. **by spending time with them in the field**
- Identifying and prioritizing problem areas **in land maintenance and condition throughout the installation training areas, by working with LCTA personnel, range control, managers, trainers, etc.**
- Defining potential LRAM project sites based on **LRAM surveys** and input from the LCTA coordinator, training land mangers, and other relevant users
- Designing needed training land repairs that include minor construction, rehabilitation, and maintenance projects to sustain training lands both for future training and testing uses and in an environmentally sound manner (Appendix H provides a listing of LRAM activities)
- Coordinating the design of LRAM projects **for the installation training lands**
- Coordinating and overseeing LRAM project execution with the range operations staff, DPW, and natural and cultural resources management staff, as applicable,

to ensure economy of scale, appropriate staff proponency for the projects, and to preclude duplication of efforts

- **Working with the ITAM coordinator,** after the project is complete, to evaluate the effectiveness of prescribed solutions and making any alterations to the installed practice

- Following-up with training land users to ensure land repair and maintenance projects meet their needs and are not incompatible with training and testing requirements or other land uses

- **Assisting ITAM coordinator in** developing the LRAM portion of the installation ITAM long-range plan and projects for inclusion in the installation annual workplan, the installation master plan, and the installation RTLP.

Appendix H provides criteria for determining best LRAM management practices.

3.1.6 Training Requirements Integration (TRI) Functions

The ITAM coordinator normally performs the management functions of the TRI component of the program. TRI component management tasks include, but are not limited to:

- Integrating training and testing requirements with land management, training management, and natural and cultural resources management processes

- Coordinating mission requirement and land maintenance with training and testing land carrying capacity to optimize training and testing land management (Appendix L provides an overview of the ATTACC methodology)

- Providing recommendations on the allocation of land to support current and projected training and testing requirements

- Providing recommendations on the land that should not be available for training and testing due to maintenance/repair requirements

- Assessing and minimizing negative impacts on training and testing land conditions through improved land allocation and event scheduling

- Making recommendations for improved land use options to include training area reclamation and reconfiguration

- Coordinating land usage with external organizations, supporting agencies, and tenant units

- Recommending LRAM project priorities, based on input from the LCTA, LRAM, training and testing community, etc.

- Coordinating the ITAM long-range plan and RTLP training and testing requirements with the INRMP and ICRMP.

3.1.7 Environmental Awareness (EA) Functions

The ITAM Coordinator normally performs the management functions of the EA component of the program. EA improves land users' understanding of the impacts of their activities on the environment. The EA program should focus on all land users to include soldiers, leaders, DA civilians, and the local community who may use training lands for recreational purposes.

The EA function is also an ideal opportunity for installations to impress upon to local community the proactive actions, care, and stewardship responsibilities that the Army integrates into their daily activities. To that end, EA management tasks include, but are not limited to:

- Developing an overall installation EA plan for all land users

- Developing and/or acquiring EA training programs to support the overall installation mission

- Developing and/or acquiring EA materials to support the ITAM program and stewardship responsibilities

- Coordinating with commanders, staff, Public Affairs Office (PAO), and community to gain command support of the ITAM Program and objectives.

3.2 Installation Staff Support to the ITAM Program

Other staff agencies **may** provide support to the installation ITAM Program. These include the DPW, **DPTM, RTLP**, environmental, natural, and cultural resources management staff, PAO, and Staff Judge Advocate (SJA).

The **DPW, DPTM, and RTLP** may

- integrate LRAM projects into the installation RPMA program based on the DPTM/G3 priority lists

- integrate ITAM with the installation's overall Real Property Management Program and Master Plan

- design and execute projects that support the LRAM component of ITAM, as requested by the DPTM/G3

- provide technical advice concerning training land maintenance and repair projects, fire management projects (e.g.,weapons and wildland), and ITAM activities that may be conducted on Army owned, withdrawn, ceded, or leased lands.

The range control, RTLP, environmental, natural, and cultural resource management staff provides the environmental technical expertise for the effective execution of ITAM.

The PAO **develops** programs that inform local civic organizations and communities of the positive aspects of how ITAM supports the Army in meeting its environmental stewardship responsibilities. The PAO products, such as articles in post and local newspapers, describe the ITAM-related activities, invite and encourage local media coverage, and coordinate military speaking engagements on ITAM Programs in the surrounding communities. The PAO may assist the ITAM staff developing the EA program.

The SJA advises the DPTM/G3 on laws and regulations that may affect training land use, management, and legal compliance.

3.3 ITAM Long Range Management Plan

Installations should develop long range management plans for ITAM that focus the direction of the ITAM Program over a five-year period. The plans will support the installation master plan and should be updated on an annual basis. At a minimum, each plan will:

- Establish installation-specific goals and objectives of the ITAM Program and its four components
- Depict projects planned for execution for each of the components by fiscal year
- Serve as the basis for ensuring ITAM accomplishes its role as a means for execution of the INRMP and support of the ICRMP and RTLP
- Be coordinated with the installation staff and approved by the installation command group.

3.4 Installation Resourcing Process

The annual ITAM Workplan is the basis for identification of installation ITAM resource requirements and the MACOM allocation of funding to installations. Annual workplans describe an installation's multi-year ITAM Program resource requirements to the MACOM and supporting agencies. MACOM and installation annual workplans reflect ITAM requirements, based on a set of standard work categories, as listed in Appendix E.

Development and submission of the installation's annual workplan is the responsibility of the ITAM coordinator in conjunction with the LRAM and LCTA coordinators, the GIS specialist and supporting natural and cultural resources/environmental staffs, as applicable. The DPTM/G3 or equivalent should approve an installation's annual workplan before forwarding it to the MACOM.

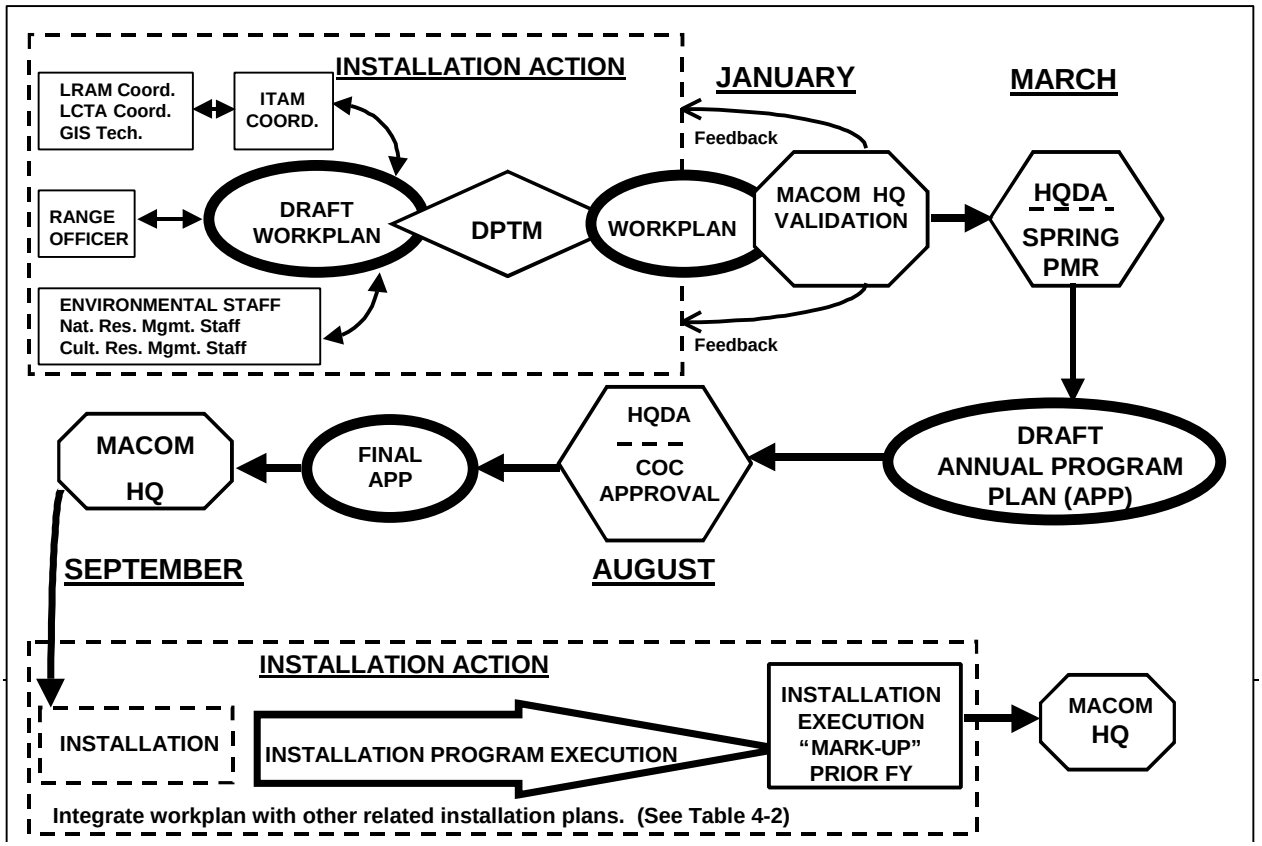
3.4.1 Annual ITAM Workplan Purpose

The workplan is an easy-to-use format for installation staffs to identify and develop future ITAM work activities and projects. The purpose of the workplan is to:

- Define individual project and work activities
- Designate, prioritize, and identify a cost to execute those projects
- Track project execution during a FY
- Describe multiyear ITAM programs and requirements at installations, MACOM HQ, and supporting agencies
- Report all ITAM resource requirements, based on the set of standard work categories described in Appendix E
- Capture program execution and adjustments over the course of a FY.

3.4.2 Annual Workplan Process

The installation workplan is developed in the early spring of each year to reflect



ITAM program requirements in detail for the following three fiscal years and in summary format for the subsequent two fiscal years. “In detail” means that all projects for that fiscal year will be listed on a worksheet and that a summary sheet will be prepared for each fiscal year. “In summary” means that only a summary sheet depicting lump sum requirements by component need be prepared for these fiscal years. Figure 3-1 depicts the workplan processing sequence from formulation of installation workplans through final funding.

Figure 3-1. Annual ITAM Workplan Process.

The ITAM coordinator, in conjunction with the LCTA and LRAM coordinators and GIS specialists, identify projects required to support the installation long-range ITAM plan, by FY. Project input is also obtained from the environmental and natural/cultural resources staffs and the installation range officer. The workplan reflects all ITAM activities for the installation. Appendix G provides a listing of the standard ITAM work categories.

Once projects are identified, they are prioritized from most to least important. Approval of these projects should be obtained from the DPTM/G3 prior to completing the workplan. Once the projects are approved, they are entered on the workplan worksheets in order by established priority. For the purpose of the annual ITAM workplan, projects include supplemental staffing, systems, products, and activities to execute ITAM for the year indicated.

Each project is described to convey the scope of work. General schedule workforce authorizations and salaries are not included in the workplan since those positions are not resourced through the ITAM MDEP. However, contractor and/or Interdepartmental Personnel Act (IPA) workforce requirements and salaries are reflected on the annual ITAM workplan.

It is not appropriate to use the annual ITAM workplan for contingency planning, such as for responding to natural disasters and/or occurrences. Installations should recognize the possibility that such contingencies may occur, but they should not reflect contingencies as a workplan project. Instead, installations should prioritize projects to use lower priority project funds to cover contingencies.

The worksheet format accommodates three projects per sheet. It is appropriate to use as many sheets as are needed to display all projects for each FY. In addition, installations need to prepare one summary sheet for each FY. Finally, each installation needs to submit the complete set of worksheets and one summary sheet for the first three fiscal years to their DPTM/G3 or equivalent. Figure 3-2 illustrates a typical submission package. Appendix F provides an example of an installation’s workplan submission package.

Once the DPTM/G3 or equivalent approves the installation submission package, the entire package is submitted electronically to the MACOM ITAM program manager. The

MACOM ITAM program manager, in conjunction with his environmental staff counterpart will review and validate, by project, the installation workplans. This process requires coordination between the MACOM and installation ITAM staffs. This helps to ensure a thorough validation of the content. Once validated, the workplan becomes a MACOM-recognized ITAM resource requirement.

The MACOM returns the validated workplan to the installations. Since DA provides a draft APP to the MACOMs in the April to May timeframe, installations can expect to receive initial budget guidance for the following fiscal year in the May to June timeframe. However, the budget guidance is subject to change, based upon receipt of the final APP in October.

The MACOM passes validated installation workplans to the DA ITAM executive agent (i.e, TRADOC-ATSC) before the PMR FY XX-1. During the PMR FY XX-1, each MACOM justifies their total ITAM requirements to the EMC. After the PMR and further analysis of workplans, the EMC recommends funding allocations to the COC. Based on COC guidance, the HQDA functional proponent produces an APP and annual budget, aggregating annual workplans and reflecting MACOM-validated installation ITAM requirements and funding levels. DA provides the MACOMs with the final **budget guidance** in October, **or whenever DOD appropriation becomes law**. Subsequently, MACOMs inform the installations of their fiscal year funding levels; typically this occurs during the first quarter of the execution year.

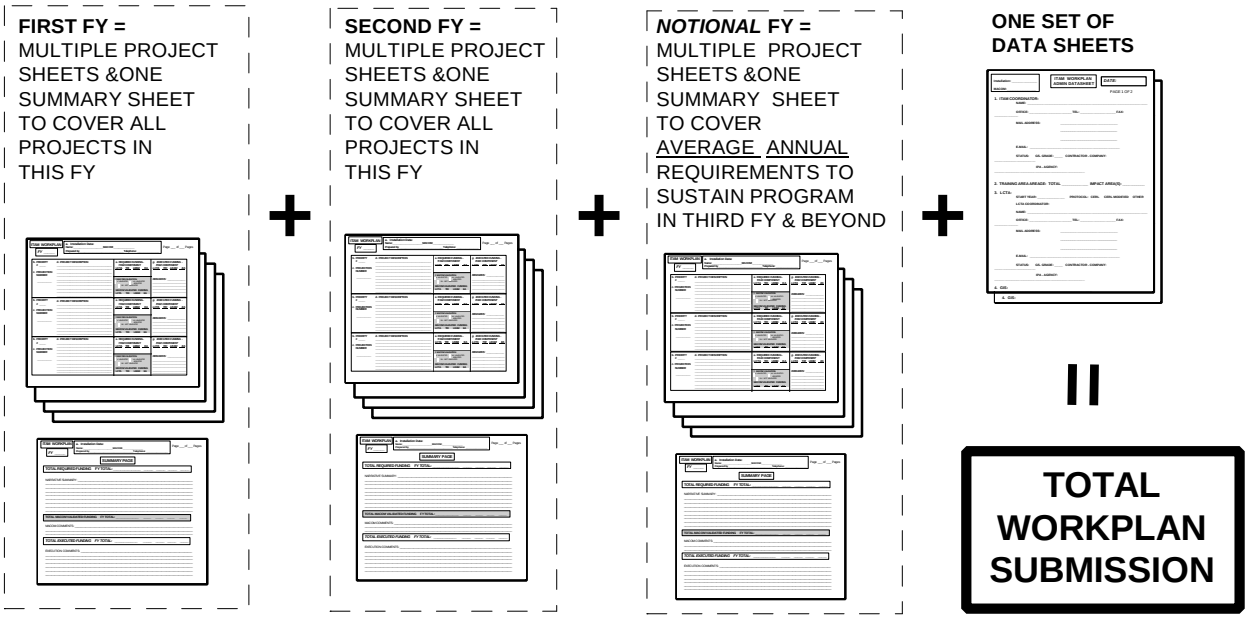


Figure 3-2. Annual ITAM Workplan Submission Package.

3.4.3 Supporting Unplanned Requirements

During the year of budget execution, unplanned ITAM resource requirements may occur. If these require immediate execution, i.e., repair or maintenance, the installation must reprioritize projects or cancel lower priority projects in order to fund the un-programmed requirements. Alternatively, the installation can adjust resourcing levels for other validated projects to fund the new requirement. In some cases, the installation may opt to use year-end funds to cover the expense of these unprogrammed requirements.

3.4.4 Unfinanced Requirements (UFR)

The installation validated workplan is recognized by the MACOM as a valid ITAM resourcing requirement. However, in most cases due to funding constraints, installations will not receive funding at the same level as that in their validated workplan. The difference between the amount the MACOM validated and the MACOM actually funded is an unfinanced requirement (UFR). During the budget development cycle, installations have the option of submitting the ITAM UFR to their MACOM. Depending on priorities established by the installation commander, the installation resource management office may opt to forward the UFRs to the MACOM. If forwarded, the UFR has the potential of being funded by the MACOM as additional funding becomes available during the fiscal year.

3.4.5 Year End Obligation Report

At the end of the fiscal year, installations will report ITAM Program obligations to their respective MACOM. Report format will be announced each FY. In general, the report will require an installation to report the total ITAM dollars obligated in the ITAM Program Element (PE) by component plus any other funds obligated in support of the ITAM Program from other PEs or MDEPs.

3.5 ITAM Program Performance

Measuring the performance of the ITAM program is very important to evaluating the success of the installation annual program. Measuring success of the program involves all stakeholders of the installation ITAM team. The G3/DPTM, as the proponent, must lead the evaluation. In actuality, evaluation will be ongoing throughout the fiscal year, but formal review should occur at least annually. Although there is not a formal process for this review, the ITAM Program Measures of Effectiveness in section 2.6 can be used as a starting point. Modification of these measures or a locally developed process will enable the installation to effectively measure the success of the program against the stated objectives in the installation long-range ITAM plan. The review can be conducted in any manner, but an in progress review (IPR) chaired by the installation DPTM/G3 or equivalent and other staff sections that support and participate in the ITAM Program, is recommended.

4.0 ITAM Program Components

Section 4 includes four major subsections that describe the purpose, objectives, and standard procedures for the successful management and execution of LCTA, EA, LRAM, and TRI at CONUS and outside of the Continental United States (OCONUS) US Army installations. In addition to the standard procedures, e.g., data collection and analysis methods, data management, standard reports, the subsections will also identify areas where nonstandard practices are acceptable.

The ITAM Program is therefore designed to sustain and maintain training lands for future generations to train on and use. Training land is a priceless asset. Facilities and equipment are repairable and replaceable. Land is repairable, NOT replaceable. Proper implementation of ITAM is a responsibility of any installation that has a major training or testing mission.

The four ITAM program components include:

- Land Condition Trend Analysis
- Training Requirements Integration
- Land Rehabilitation and Maintenance
- Environmental Awareness.

This section includes the procedures and guidance to properly implement the ITAM Program. Numerous appendices further magnify information in this section.

4.1 Land Condition-Trend Analysis (LCTA)

LCTA is the component of the ITAM Program that provides for the collection, inventorying, monitoring, managing, and analyzing of tabular and spatial data concerning land conditions on an installation. It provides the necessary data to evaluate the capability of training lands to meet multiple use demands on a sustainable basis. It incorporates a relational database and GIS used to support land use planning decision processes. LCTA collects physical and biological resources data to relate land conditions to training and testing activities. These data are intended to provide information to effectively manage land use and natural resources.

4.1.1 LCTA Goals

The goals of an installation's LCTA program are to:

- Provide in an efficient manner the data, analytical capabilities, and recommendations associated with sustained usage of testing and training lands

- Provide standard data items that support training land management and land use decisions
- Provide data to **identify, monitor, and support prioritization** of LRAM, EA, and TRI efforts
- Provide data input to an installation's plans, such as the INRMP, ICRMP, installation master plan, RTLP, etc.
- Provide a means to collect and maintain the GIS database
- Provide a means for installation training land managers to measure and monitor natural and cultural resources
- Provide methods to assess the effect and impacts of training and testing on natural and cultural resources
- Assess the impacts of NR management on training and testing (e.g., prescribed burning, agricultural leasing)
- Allow for adaptation for specialized methodologies to meet local requirements.

4.1.2 LCTA Objectives and Tasks

The LCTA component has four objectives, each with supporting tasks. Together, the objectives and tasks provide overall guidance for the management and execution of this component of the ITAM Program.

NOTE: Rewrite objective 1 to differentiate between who does what. ITAM or Env. Staff. PMR comment – simitar to INRMP, reference PLS

Objective 1: From the baseline data, monitor natural and cultural resources, and analyze data for trends and impacts to natural and cultural resources. Include identification of possible sources of changes and trends. Data must be technically valid and withstand public scrutiny.

Tasks:

- Gather and maintain **core** data elements IAW the prioritized listing of ITAM data elements. (See Appendix J for the listing of data elements.)
- Establish a natural and cultural resource monitoring system appropriate to the installation. (See Appendix K for information on LCTA methods.)

- Incorporate remote sensing, where appropriate, to supplement monitoring procedures and facilitate trend and change detection analysis.[8]

- Provide analysis of LCTA data to facilitate land management decisions by installation management staffs. (i.e., provide the data for the ATTACC model and support scheduling and land allocation decisions)

- From the analysis, identify possible cause and effect of trends, including possible local or regional trends that are applicable.

Objective 2: Identify and recommend land rehabilitation and maintenance priorities.

Tasks:

- Employ a Site Rehabilitation Priority (SRP) type methodology to identify areas for redesign, rehabilitation, and/or repair.

- Provide recommended LRAM priorities to the installation ITAM Coordinator or appropriate land management staff. (Appendix G provides the list of standard LRAM work categories used for annual ITAM workplan development.)

- Identify projects recommended for other sources of funding and/or cooperative funding.

- Monitor selected LRAM projects for effectiveness. (Appendix H provides criteria for LRAM best management practices.)

Objective 3: Provide a GIS capability to installation ITAM programs.

Tasks:

- Develop and maintain standardized data layers. (See Appendix I for further information on the core and optional GIS data layers)

- Maintain data in accordance with TSSDS, including metadata.

Objective 4: Provide information that may affect force structure and stationing decisions at MACOM and DA levels.

Tasks:

- Maintain selected training facility and training/testing area baseline data.

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[8] See the Remote Sensing Users' Guide for an analysis of the various types, platforms, and uses of each system.

- Maintain land condition baseline data. (See Appendix I for information on the core and optional GIS data layers and Appendix J for a prioritized listing of data elements.)

4.1.3 LCTA Data Elements

Requirements exist at the HQDA, MACOM and installation levels for the data elements collected in LCTA. These requirements supply information for a variety of decision support and information management systems such as the ATTACC model, GIS, and RTLP-AS.

The environmental characteristics associated with an installation and the type of training and testing that occurs on an installation affect the types of information needed to support the LCTA objectives. Baseline data for each installation may be different, but there are a subset of common baseline data for all installations. Appendices providing further details on LCTA data elements are as follows:

- **Appendix I** provides the core and optional GIS data layers. Core data layers are a standardized requirement at all ITAM installations. Maintenance of this data should be considered a top priority effort. Optional Data layers provide additional information supporting ITAM management.

- **Appendix J** provides the prioritized listing of ITAM data elements. These data elements are required for effective ITAM management. Data elements are acquired through LCTA and non-LCTA sources as indicated in the appendix.

4.1.4 LCTA Data Collection and Monitoring

LCTA is not limited to a standard methodology. Instead, it encompasses a combination of techniques, including remote sensing, data collection, and use of related data sources from other agencies. The methods described are considered valid for ITAM LCTA and are termed "LCTA II."[9] Appendix K provides a matrix of LCTA II methods, their relationship to LCTA data elements, and information on sampling size and frequency.

Whatever the methodology or combination of methods, the results must be statistically defensible and within acceptable confidence limits. Additionally, the choice of methods must meet installation specific needs for land management and the collected data must provide a foundation to achieve the following:

[S] **See the LCTA II August 1996 Report for information on LCTA II.**

- Analyze the ecological status (condition) and trend (degradation or improvement) of surface water quality, soil stability, vegetation, and wildlife for areas on the installation affected by training, testing, or LRAM projects

- Identify associations, i.e., empirical relationships, between resource types, their condition trends and land use frequency, duration, and intensity.

- Establish factors supporting estimates of mission impact to and from natural and cultural resources.

To assess how well LCTA methods are supporting the goals and objectives at an installation, answer the list of questions below.

- What are the objectives you are trying to satisfy?

- Do your methods provide data to satisfy the data requirements you have defined?

- Is the frequency of data collection appropriate to your situation?

- Are you collecting extraneous information that do not address data requirements?

- Do you have an adequate number of plots given the variability in your sample?

- Are you taking full advantage of the experience of other land management agencies and organizations when addressing common or similar issues?

- How do you plan to manage and analyze your data?

4.1.5 LCTA Data Analysis and Management

Once data are available, the elements are assimilated and analyzed to provide the following:

- Land use summaries, i.e., classification of land usage, that provide optimal training opportunities, based on the land's capabilities

- Ground disturbance summaries that identify training and testing impacts, based on the environmental conditions of the land

- Ground cover summaries that provide information to assist resource conservation on potential erosion problems

- Aerial cover summaries that provide information used to determine land cover and concealment

- Woody vegetation summaries that provide information on forest management
- Revised Universal Soil Loss Equation (RUSLE) calculations that provide input for the ATTACC model
- Plot summaries that provide historical trend data of impacts over time
- Training load summaries that provide levels of mission activity at which land use resources can be sustained.

4.1.6 LCTA Reports

The criteria for successfully communicating LCTA information and analysis are as follows:

- Keep data entry and management systems simple
- Use non-scientific terms whenever possible to communicate information of a technical nature
- LCTA should meet the needs of, and answer the questions raised by the training and testing communities; this shall include recommendations and alternatives and not be limited to informational support.

The annual report should describe exactly what was done on the sample sites, a brief status of the program, and any additional information that could highlight impacts on training, testing, and resource management. The types of information that may be relevant in the annual report are:

- SRP or LRAM survey
- Wildlife & avian surveys and the numbers of sites sampled
- Sample plots, numbers of sites, and types of samples
- Update species list and other important information
- Impacts to sensitive sites. (e.g., Threatened and Endangered Species (TES), Cultural, landfills)

4.1.7 LCTA Coordination

Table 4-1 indicates installation plans and programs that will benefit from LCTA maintained data bases and data layers. ITAM and LCTA Coordinators should ensure that LCTA type data is exchanged between ITAM and these programs to benefit both

programs. In some cases, LCTA data is an integral portion of these plans such as the Integrated Natural Resources Management Plan (INRMP).

NOTE: Include the agency responsible for each plan in table description.

Table 4-1. Related Plans and Programs.

Plan or Program	Description
Integrated Natural Resource Management Plan (INRMP)	This plan is required by the Sikes Act. The INRMP is a five year plan which integrates all natural resources with mission uses and other uses of training/ testing lands. The ITAM program is the means for integrating the mission with the natural resources. The LCTA databases and layers are a very important part of this process. Data from LCTA plots provide critcal information on changes and trends in the make-up of installation vegetation, and can identify cause and effect relationships for these changes. These changes can be percent of ground cover, proportions of annual vs. Perennial vegetation, and species composition, to name a few. These all support the installation INRMP, both in preparation of the plan and in executing its' properties throughout the 5 year plan.
Erosion Control Plan (ECP)	This plan is designed to: identify current and possible erosion sites, prioritize these sites for repair, design erosion control structures and projects, and, should identify the cause of the erosion so that appropriate funding sources are used for each project. Various data layers in the LCTA databases and the use of SRPs aid in the development of the ECP. It is appropriate for the installation to display erosion sites and erosion control structures as a data layer in the ITAM GIS. LCTA data can be an early indicator of future revegetation requirements by using the evaluation of bare ground to assess changing land conditions.
Integrated Cultural Resource Management Plan (ICRMP)	This plan provides for the inventory of, accountability for, and safeguarding of archeological sites in training/testing lands. This includes Native American sites on the installation. The LCTA role in this plan is to provide a spatial display of these locations on the installation along with any pertinent tabular data and to ensure that these locations are visually displayed on environmental sensitivity maps or training overlays/maps as "off limits" areas. In some cases, LCTA data can help determine if there is sufficient soil and or vegetation to aid in the protection of archeological sites from disturbance.

Plan or Program	Description
Range and Training Land Program (RTLP)	Required by AR 210-21, the RTLP provides an inventory of installation training land and facilities, identifies mission requirements for training land and ranges, provides a management system for Army training lands, and ensures that environmental conditions and limitations are integrated into installation training plans and requirements. The plan is developed by the installation DPTM and or the installation G3. Various LCTA data layers will feed into the RTLP through the ITAM program.
Outdoor Recreation Plans (OCP)	Outdoor recreational programs such as fishing, boating, camping, off road vehicle use, hunting, etc., use installation training/testing lands. The LCTA program can monitor the condition of the areas used for these purposes, provide recommendations on outdoor recreational land uses, and provide spatial products both to support this program and for conflict resolution of these lands at Range Control. Vegetation and bare ground data can help determine management priorities for recreational programs, especially camping, hunting, and fishing.
Installation Forestry Program/Plan (IFP)	LCTA data can supplement forest inventory data to aid in the determination of stand conditions for both mission support, species habitat, and forest health. While the forest inventory data focuses on the over-story vegetation, LCTA data will provide information of the mid- and under-story plants. Combining these two data sets increases the utility of both.
Installation Pest Management Plan (IPMP)	Range management actions commonly require control of weeds, insects, or other pest species via releases of chemical pesticides into the environment. Risks of human injury from insects, ticks, and the diseases they can transmit (e.g., Plague, Lyme Disease, Hanta Virus) are also eliminated or controlled in areas where training occurs. Pest control operations of all types at Army installations must be performed by personel meeting DoD and EPA training requirements, and must be described in installation pest mangement plans (IPMP) that have been reviewed and approved by Command-level professional consultants. LCTA data can contribute both to the completeness and effectiveness of IPMPs for pest management operations in installation training areas.
National Environmental Protection Act (NEPA) Documents	LCTA data, to include GIS layers, can be a valuable aid to the preparation of Environmental Assessments and Environmental Impact Statements.

4.2 Training Requirements Integration (TRI)

TRI is a decision support procedure that integrates all requirements for land use with natural and cultural resources management processes. TRI integrates the installation's training and testing requirements for land use derived from the RTLP, range operations and training land management processes, and the installation training readiness requirements with the natural resource conditions of the installations lands. ATTACC is the standard method used in the TRI process. The integration of all requirements occurs through continuous consultation between the Director of Plans, Training, and Mobilization DPTM, natural and cultural resource managers, and other environmental staff members**,** as appropriate. The INRMP is an implementing document and requires TRI input.

4.2.1 TRI Goals

NOTE: Address TRI's need to define and prioritize LCTA, LRAM, and EA requirements on the assumption that resourcing (i.e., funding, time, and/or staff) will not be available for all data collection and analysis. Also that TRI assesses mission landscape requirements and communicates them to the environmental staff.

The Army goal for TRI is to:

- Ensure sustained accessibility to adequate training lands to support training to standards under realistic natural conditions
- Provide military trainers and land managers with the necessary technical and analytical information to
  - integrate doctrinally based training and testing with land constraints and
  - quantify carrying capacity of training lands.

TRI is a tool that supports the Army's requirements for environmentally sustainable training lands. TRI improves coordination, facilitates cooperation, decision-making, and allocation by providing uniform information on land conditions, trends, and any necessary modification requirements. The TRI goals are reached when training, testing, and environmental requirements are balanced in the decision making process.

4.2.2 TRI Objectives and Tasks

The TRI component has four objectives. Together the objectives and tasks provide the overall guidance for the management and execution of this component of the ITAM Program.

Objective 1: Integrate training and testing requirements with land and training management.

Tasks:

- Review, evaluate, and reconcile information from all pertinent sources to include: LCTA, LRAM, PLS, RTLP-AS, RTLP, ATTACC, RFMSS, Mission Essential Task List (METL), INRMP, CRMP, etc.
- Accommodate as appropriate secondary land uses such as forestry, grazing, hunting, fishing, and recreation.
- Use LCTA data and supplemental information from conservation /environmental staff to determine if conservation goals are being met by various TRI strategies.
- Develop and coordinate the annual ITAM Workplan, with input from the TRI team
- Ensure the forestry program supports training land requirements.

Objective 2: Optimize training land management decisions by coordinating mission requirements and land maintenance activities with training and testing land carrying capacity.

Tasks:

- Assess impacts of training and testing on land use.
- Minimize negative impacts on the land conditions, environment, and training mission through improved decisions regarding land allocation and event scheduling.
- Support the development and/or revision of the INRMP and ICRMP by providing training requirements data from the Range Development Plan (RDP).

Objective 3: Identify existing and projected training land resources and prioritized land use requirements.

Tasks:

- Advise on the allocation of land to support current and projected training area requirements.
- Provide information to commanders and units on land conditions and land use options.
- Coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.

Objective 4: Generate prioritized requirements for land rehabilitation, repair, and/or reconfiguration.

Tasks:

- Review all SRP's generated by LCTA, LRAM, and other sources.
- Review all reconfiguration projects generated by DPTM personnel.
- Review and provide input to post-wide erosion control plan.
- Submit prioritized LRAM project list to Range Officer/DPTM for approval.

4.2.3 TRI Program Execution

TRI program execution includes several elements including coordination, integration principles, and methods.

4.2.3.1 TRI Coordination

The TRI function is managed by the ITAM Coordinator with direct support from the Range and Training managers, and the LCTA and LRAM Coordinators. It is further supported by the natural resource management/environmental staff and the DPW. In addition, there is coordination with external agencies and Federal departments.

TRI achieves the "training-environmental" balance and interface, which is key to ITAM. TRI requires continuous interaction and coordination between the operations/training staff and the natural resources management/environmental staff to make wise land use planning and management decisions that meet regulatory compliance and training and testing activity requirements.

ITAM staff at the installation should conduct continuous coordination to accomplish the objectives. They should meet at regular intervals to facilitate information exchange and to analyze available for recommendations for the assignment and allocation of training and testing requirements based on available lands or land condition and the environment.

4.2.3.2 TRI Principles

TRI principles are as follows:

- The DPTM identifies existing and projected training resources, **via** a training facility baseline inventory, such as that in RTLP Development Plan (RDP). That inventory describes quantities and types of maneuver land, numbers and types of

ranges, and special training facilities, (e.g. water crossing sites and Military Operations on Urban Terrain (MOUT) training facilities).

- The DPTM also identifies existing and projected training requirements. Training requirements are derived from mission analysis of all land users, including military units, civilian agencies, and other activities. Training events, construction/renovation projects, and activities which occur within the confines of the training land boundaries, are considered in TRI execution.

- The RTLP process also supports assessment of potential impacts of new weapon systems, unit restructuring and realignment, force modernization, and emerging training strategies which will impact land use.

- The DPTM makes decisions about the ability of the training lands (based on ATTACC, LCTA, and other resource surveys) to support training and testing requirements. This is a coordinated effort with natural resource management/environmental staff to ensure their clear understanding of installation missions and training and testing requirements.

- Carrying capacity, or training and testing land sustainment is central to the TRI process. Scheduling and allocating options are based on this prediction process. A preliminary estimate of carrying capacity is determined by use of the ATTACC model in RTLP-AS. Over time, installation staffs develop factors to predict the effect of training and testing events on specific areas of the installation. Further refinement of this estimate is accomplished by use of LCTA data and other resource surveys.

- The DPTM allocates land to support current and future requirements for training and training related projects, (e.g., range construction), to maintain training readiness while generating the lowest possible negative impact on the land conditions and the environment, thus conserving land assets for sustained use. Essential command coordination is accomplished as required.

- Through TRI, the DPTM provides commanders with an analysis of the recommended course of action and alternatives available for the assignment and allocation of training and testing requirements to available lands. Analyses of alternatives include their relative environmental impacts to allow commanders to make decisions weighing readiness and conservation factors.

- TRI provides units with the best available training land parcel(s), based on land condition, that are capable of supporting their specific training and testing requirements. The TRI process places projects on mission-essential requirements as the highest priorities.

The majority of alternative actions can be grouped into one or more of the following management options:

- Allow planned events to take place as scheduled
- Accept increased LRAM costs
- Limit total use on the installation by
  - number of users
  - total days of use
- Acquire additional training land
- Transfer activities to other installations
- Redistribute use on the installation via
  - seasonal redistribution
  - spatial redistribution
- Reconfigure land for optimal use
- Modify allowable kinds or location of
  - tracked/wheeled vehicle use
  - cutting of woody vegetation
  - digging
  - training on wet soils
  - training during periods of high fire hazard
  - training during periods of limited visibility
  - training on unfrozen soils
- Manipulate natural resources to improve usability through
  - increased concealment
  - hardened sites
  - increased mobility
- Alter behavior of users:

- teach to protect
- regulate to protect.

4.2.3.3 TRI Methods

TRI decision making and allocation are based on training and testing events and the effects of those events on natural and cultural resource conditions. This concept of land carrying capacity and sustainment is primarily limited to subjective judgment based on observed training and testing impacts. More objective scientifically-based land carrying and sustainment measures can support predictive decision-making with use of personal computer (PC) based models. The models allow installation personnel to calculate training load function (i.e., MIM), assess the impacts of alternative training strategies, and determine alternative conservation management practices (LRAM costs).

ATTACC is a methodology to estimate the impact of training land condition in terms of Maneuver Impact Mile (MIMs), which are based on the combination of mileage projects from the Battalion Level Training Model (BLTM) which uses training miles areas, events, periods and units, such as armor or forward support battalion. ATTACC adopts the Revised Universal Soil Loss Equation to quantify the cost for using land for ground forces training. Appendix L provides an overview of the ATTACC methodology.

The ATTACC standards for training and testing land carrying capacity are based on the erosion status as measured by the RUSLE. The RUSLE is a widely accepted user-friendly erosion prediction model which utilized climate, soil erodibility, topography cover, and conservation support practices. The erosion estimate is compared to an erosion tolerance value to express the current erosion status. Installation land managers can also determine an erodibility index to represent the natural potential of the land to erode without human disturbance.

ATTACC will address all standard Army units, training events, and weapons systems in calculating training load and its impact on land. The ATTACC methodology must be adapted to each installation and training area to predict the capability of any site to support that load. ATTACC also provides flexibility by allowing installation personnel the ability to adjust for local conditions and requirements. ATTACC will primarily operate within RTLP-AS/RFMSS to provide installation training load calculations. ATTACC can be adapted to operate independently if necessary. For more information on ATTACC, refer to the ATTACC Handbook, which is available via the ITAM website**.**

4.3 Land Rehabilitation and Maintenance (LRAM)

LRAM is a preventive and corrective land rehabilitation and maintenance procedure that reduces the long-term impacts of training and testing on an installation. It mitigates mission and training effects by combining preventive and corrective land rehabilitation, repair, and/or maintenance practices to reduce the impacts of training and testing on an

installation. It includes training area redesign and/or reconfiguration to meet training requirements.

LRAM uses technologies such as re-vegetation and erosion control techniques to maintain soils and vegetation required to support the military mission. These efforts are specifically designed to maintain quality military training lands and minimize long-term costs associated with land rehabilitation or additional land purchase.

LRAM includes programming, planning, designing, and executing land rehabilitation, maintenance, and reconfiguration projects based on requirements and priorities identified in the TRI and LCTA components of ITAM.

4.3.1 LRAM Goals

The goals of an installation's LRAM program are to:

- Sustain long-term training and testing on lands held under the stewardship of the US Army
- Sustain the overall condition of installation lands to ensure long-term military viability of its installations
- Apply best management practices for design and execution of LRAM to ensure that the rehabilitation, repair and maintenance results are commensurate with the applied resources
- Coordinate long-term land maintenance plans with other real property management programs on an installation.

4.3.2 LRAM Objectives and Tasks

The LRAM component has eight objectives. Together the objectives and tasks provide the overall guidance for the management and execution of this component of the ITAM Program.

The objectives of the LRAM program are as follows:

- Identify land maintenance requirements
- Identify project sites that require restoration, rehabilitation, or reconfiguration to improve access to training areas and increase duration of use
- Develop a scope of work for the projects that includes a site description, design, resources required and expected outcome
- Develop project prioritization lists based on LCTA data, GIS database, input from TRI, and other information available

- Execute projects as resources are made available
- Evaluate the effectiveness of the completed projects
- Ensure that completed projects receive adequate preventative maintenance
- Coordinate long-term land maintenance plans with other real property management programs on an installation.

4.3.3 LRAM Program Execution

To achieve LRAM objectives, each installation identifies and executes projects to either prevent or solve specific problems. For example, the loss of a natural groundcover on a steep slope used for training maneuvers can increase the amount of soil erosion, affect the safe use of, and/or create a sediment build-up in or near a wetland. By combining re-vegetation with redesign of the training area, LRAM prevents recurrence of the problem.

Typical tasks related to LRAM project execution include, but are not limited to the following:

- Identifying potential project sites
- Developing project priorities
- Conducting project planning, coordination, and design
- Executing project
- Evaluating project effectiveness.

4.3.3.1 Identifying Potential Project Sites

Techniques utilized at installations to identify LRAM projects vary and may be identified by the following methods or sources:

- Field survey
- Communication with land users and managers
- Loss of land use and training or testing capability
- Deteriorating land conditions
- Completed Site Rehabilitation Prioritization forms
- LCTA data

- Safety issues
- Training use data (RTLP-AS)
- Catastrophic events.

4.3.3.2 Site Rehabilitation Prioritization (SRP)

SRP is a means to address complex problems by combining common sense, experience, and a willingness to look for solutions. The purpose of SRP is to rank training sites based on military land use types and conditions, qualitative ocular inspection of polygons, and annual site visits and follow-up. Using a checklist and simple algorithms, SRP provides decision support data for Land Rehabilitation and Maintenance (LRAM) projects and priorities.

The basis for decision support through SRP is to define polygons on an installation that merit trend analysis and to use a simple check list and collect data on each defined polygon. Polygons include training sites, road corridors, gravel pits, etc. The SRP checklist in figure 4-1 contains categories with weighted factors and algorithms that consider percent slope, percent of polygon degraded, signs and/or types of erosion present, potential impacts, and visibility and/or accessibility. The weighted data categories used to score a polygon include site condition (shown as “percent [%] degraded” on the SRP check lists), erosion status, potential impacts, and visibility/accessibility. Other categories of data on a checklist may include ground cover, site description, military use description, etc.

Site Rehabilitization Prioritization

LCTA Plot/Training Area Site # ____ Date_____ Surveyors_____
Quad/UTM/GPS Location_____ County_____

% Polygon Degraded(PDT)

1 - 5%	1.0 x ____ =	____
6 - 10%	1.5 x ____ =	____
11 - 20%	2.0 x ____ =	____
21 - 30%	3.0 x ____ =	____
> 31%	4.0 x ____ =	____

(PDT) Total _____

% Slope(ST)

1 - 2%	1 x ____ =
3 - 5%	2 x ____ =
6 - 10%	6 x ____ =
11 - 15%	12 x ____ =
16 +	24 x ____ =

(ST) Total _____

Signs of Erosion (ET)

% of Polygon in Active Erosion ____

Check Types of Erosion Present
- Sheet ____
- Gully ____
- Pedasal ____
- Debris Dam ____

Potential Impacts(PIT)

Flat Vegetative Area	1 x .25 =
Secondary Drainage	2 x .50 =
Culvert/Road Drainage	3 x .75 =
Prima ry Drainage	4 x 1.5 =
Wetland /Riparian/Lake	5 x 3.0 =

(**PIT**) Total _____

____ % x (PDT) x (ST) = Erosion Total **(ET)** ____

Visability/Accessessibility(VAT)

Remote	1 x .25 = ____
Secondary Road	2 x .25 = ____
Primary Road	3 x .50 = ____
Water Access	4 x 1.0 = ____
Paved Road	5 x 2.0 = ____

(**VAT**) Total ___

(ET) + (PIT) + (VAT) = Site Rehabilitization Total ____

Military Use Site Description _____

Site Improvement Recommendations

Return to grade _____
Reseed _____
Rock _____
Other _____

Repair Cost Estimate

Site Acreage ____
- Minor ____
- Moderate ____
- High ____

Comments_____

Figure 4-1. SRP Form.

NOTE: Include instructions for using the SRP form in an appendix.

There are several versions of the SRP checklist. The checklists vary, based on installation specific preferences and needs. The SRP field crews use the checklists to record what they see at each polygon that they visit. After surveying the polygons and filling in checklists, the field crews tally scores for polygons, using the data on each checklist. The total scores help prioritize LRAM needs at the different polygons.

The checklist in figure 4-1 can be used to record improvement recommendations, estimates, and descriptions of potential legal or public relations issues associated with a polygon. The process for collecting SRP data and providing decision support information for LRAM projects and priorities requires a field crew, usually of one to three persons, clip boards, and a stack of blank SRP check lists. The field crew drives out to the training areas to survey and record the site data associated with each specific polygon.

To fill in the check list, the field crew first estimates the percentage of the polygon that has been disturbed and is not re-vegetated; this data is the percent degraded. Next, the field crew assesses the erosion status by estimating the percentage of the polygon that shows current or past disturbance and average percent slope of the entire polygon. The crew then records examples of sheet, gully, or wind erosion.

When the field crew(s) complete the checklists they use the algorithms to calculate a total score for each polygon. After all polygons are scored, the ITAM team members compare the scores. The results support informed decision making regarding LRAM priorities.

To assess erosion impacts, the crew surveys a polygon for exposed bare soil, alluvial fans at the base of slopes or in water sources, and debris dams formed by small leaves, grass, plant matter, silt, and other materials. When erosion is present on a polygon, the crew notes the type of erosion and does a visual appraisal to quantify the extent of the erosion. The results of the crew's assessment are quantified as the percentage of the polygon degraded (PDT) and the percentage of slope (ST). Next, the crew estimates the potential impacts (PIT) from erosion, based on the physical characteristics on and near the polygon.

The categories of physical characteristics include flat vegetative area, secondary drainage, culvert/road drainage, primary drainage, and wetland/ riparian/lake. The field crew completes the checklist by adding comments, cost estimates, and other recommendations. Next, they total the SRP score. The score along with the relative importance of a particular site to the installation's training mission help prioritize LRAM projects.

4.3.3.3 Developing Project Priorities

There are numerous sources of information that can assist in prioritizing LRAM projects. These include the following:

- METL training requirements
- Input from military land users
- Site Rehabilitation Prioritization ranking

- Sensitive area location in relation to training area (e.g., wetlands, endangered species habitats, natural areas, private property)
- Safety issues
- Loss of training and testing capabilities
- Deteriorating land conditions
- Training and testing use data (RTLP-AS)
- Catastrophic events
- Impacts to real property.

4.3.3.4 Conducting Project Planning, Coordination, and Design

Project planning is essential for successful execution of LRAM projects. All interested parties must communicate and coordinate with each other frequently to maximize efficient use of resources and ensure successful project execution. To this end, project planning, coordination, and design should include the following:

- Construction/rehabilitation design
- Cost estimate
- Resource requirements (e.g., labor, materials, equipment)
- Impact to training
- Project timeline
- Support preparation of applicable permits and approvals from affected state and federal agencies
- Maintenance requirements
- Applicable schedules
- Coordination procedures and points-of-contact
- Notifications

Other important considerations affecting project plans include:

- Soil properties

- Topography
- Accessibility
- T&E species
- Cultural resources
- Training realism
- Vegetation
- Water quality
- Environmentally sensitive areas.

Appendix E includes standard LRAM work categories and provides information on Best Management Practices (BMP).

4.3.3.5 Executing LRAM Projects

There are many sources of labor available for LRAM project execution. These include, but are not limited to engineering units, private contractors, in-house personnel, universities, volunteer groups, and state and federal governmental agencies.

Proper execution of LRAM projects requires close coordination, communication among all activities involved, and in some cases a paper trail. Therefore, it is important to include the following information or documentation as a part of a project folder or worksheet:

- Designs and specifications
- Applicable permits and approvals available and requirements implemented (e.g., storm water, 404 permits, air permits, biological opinions, cultural resources, NEPA documentation)
- Progress reports/onsite visits
- Records of labor and equipment utilization
- Before, during and after photos, drawings, or sketches
- Safety records
- Contractual information
- GIS maps and analyses.

4.3.3.6 Evaluating Project Effectiveness.

The effectiveness of a LRAM project can be evaluated through after action evaluations and customer satisfaction polling. Examples of both of these include the following:

- LCTA special use plots
- Remote Sensing (i.e., satellite imagery or aerial photography)
- Levels of support provided to trainers to complete mission
- After action evaluation:
  - Site observation to assess if project meets design specs
  - Assess lessons learned
  - Determine if additional LRAM work is needed to enhance the project
  - Identify routine maintenance requirements
  - Determine if additional monitoring, i.e., LCTA, remote sensing, aerial photos, etc, is required
- Customer satisfaction – feedback from land users
- After action reports
- Determining if project completed IAW designs and specifications
- Periodic evaluations
- Preventative maintenance checks, as needed
- Project completed within projected costs and schedules.

4.4 Environmental Awareness (EA)

EA provides users of Army lands with a better understanding of how their activities impact the environment and provides information to improve public support of Army Environmental Stewardship. ITAM EA addresses specific environmental sensitivities at the installation level. It is intended to inform land users of restrictions and activities to be avoided to prevent damage to natural and cultural resources. The EA component applies to soldiers, other services using Army lands, installation staff, other land users, and the public. The EA component also includes efforts to inform environmental professionals of Army and installation mission and training activities.

4.4.1 EA Goals

Land users, both military and civilian, must be endowed with a sense of pride in and responsibility for maintaining the training land classroom. The goals of an installation's EA program are to:

- Minimize resource damage by indoctrinating land users of how their activities impact the environment
- Instill a sense of pride and stewardship responsibility.

4.4.2 EA Objectives and Tasks

Good stewardship equates to good operational security. Excessive maneuver damage provides a signature that a unit leaves in the field, providing valuable information to enemy forces. Trash left in the field provides valuable clues to the enemy forces such as the morale, unit size, and type of unit that increases soldier vulnerability during conflicts. While at some installations this may not have direct impacts today, when units are deployed anywhere in the world for a conflict tomorrow, it is absolutely critical to train as you fight. Being aware of and practicing simple procedures like policing the training areas and avoiding unnecessary maneuver damage is a component of sound stewardship.

When land users practice environmental stewardship in the field, they are also achieving Army mission objectives. The EA program at an installation should provide the land users with an understanding of how their mission, training, testing, and other activities impact the land's capacity for sustaining a realistic training environment. It should also educate land user on how their land use affects the resident wildlife and vegetation.

The EA component has three objectives. Together the objectives and tasks provide the overall guidance for the management and execution of this component of the ITAM Program. Command emphasis is critical to the success of the EA Program.

Objective 1: Educate land users of their environmental stewardship responsibilities. Successful management of training lands requires land users to have a clear understanding of the installation's mission(s).

TASKS

- Develop Educational Materials. An installation EA program includes some general but primarily installation –specific multi-media materials, created locally at the installation level or centrally for Army-wide distribution.
- Distribute EA Materials. Materials will generally be distributed at three levels, as follows:

- Those products designated for individual soldiers
- Those products designated for unit leaders
- Those products designated for non-military land users.

Objective 2: Improve public relations through EA. We must communicate our success at sustaining mission activities while preserving Army land. The installation PAO *must* be involved.

TASKS:

- Establish and maintain credibility with the public. Opening or maintaining lines of communication with local governmental agencies. Outside the local government, retired military organizations, concerned citizen groups and others (which are usually identified by their calls to installation headquarters) may be included.
- Promote quick and accurate responses to public questions and concerns.

Objective 3: Conduct operational awareness for environmental professionals.

TASKS:

- Convey installation mission and training and testing objectives to environmental professionals.
- Conduct formal training (e.g., Army 101).
- Provide hands on orientation of weapons systems and observe training and testing activities
- Demonstrate that the Army is a good steward and is sustaining lands in an environmentally sound manner.

4.4.3 EA Program Execution

EA program execution includes developing and distributing products and conducting operational awareness activities.

4.4.3.1 Develop EA Products

There are numerous elements that should be analyzed to choose the best media and format of an EA product. The elements include design, format, and possible sources.

- Design and Format. Some considerations when defining EA product format are as follows:

- What message are you trying to convey?
- Who is the audience?
- What materials can the audience access?
- Will the audience routinely see the message?
- Does the audience respond to visual or written materials?
- How will you determine message length and level of complexity?
- What is your budget?

- The most common formats for EA products include:
  - Soldier Field Cards
  - Leader Handbooks
  - Posters/Photos
  - News Articles
  - Briefings (e.g., Computer generated, slide shows, video tapes)
  - Pamphlets/Brochures
  - Web sites
  - Maps and overlays

- Sources of EA Materials. When acquiring EA products, an installation needs to define the source or provider of the EA product. The Army's Environmental Awareness Resources Center (AEARC), located at the Huntsville Division, US Army Corps of Engineers, Huntsville, AL, serves as the center of expertise for ITAM EA. AEARC supports HQDA, MACOMs and installations in the production of ITAM EA material and products. AEARC is a repository of such products and thus supports product quality and standardization across the Army.

  The AEARC provides technical, educational, graphics, and reproduction services that support the Army's ITAM Program. It has the resources to analyze, design, and develop environmental training and awareness courses, programs, and products. AEARC resources include instructional systems specialists, environmental protection specialists, graphic artists, video production specialists, and word processors.

ITAM Coordinator and ITAM personnel, along with AEARC instructional systems and environmental protection specialists, collaborate in designing and developing installation or activity specific training or awareness products.

Army installation personnel may submit design requests to the AEARC. A draft design will be produced and returned to the customer for review. After review, the final design will be reproduced in the quantities the customer desire.

The AEARC can create almost any type of printed graphical aid. Typical products are three-fold brochures, soldier field cards, Rolodex cards, placards, posters, diagrams, stickers, etc. All the products can be tailored to meet the specific Army installation or activity need. Installations may submit their own designs for reproduction. These designs may be hand sketches or electronic drawings in such formats as Windows metafile, postscript, tagged image format, computer graphics metafile, etc. Figure 4-4 provides AEARC tips on developing videos.

Another source for EA materials is the Soldier Radio and Television Service, an agency of the Office of the Director of Public Affairs, HQDA. The Soldier Radio and Television Service also produces ITAM EA products, but these are designed specifically for the television and radio media.

A convenient option for acquiring EA materials is local print shops. These can be especially helpful when you have an idea for EA materials you want to develop. They can provide input on the best ways to display an idea and on the materials to use.

Finally, there are other miscellaneous options for acquiring EA materials. For example, other branches of the military service, government, and non-government sources, such as Universities, private vendors, state and local conservation agencies, and environmental clubs such as the Sierra Club, Nature Conservancy, Audobon Society, etc.

ITAM Videos Customized for the Installation

Videos are typically 10 to 13 minutes long, and they're designed to meet the needs of both operational people who run the installation and the training program, and the environmental and resource management people.

The AEARC generally starts the video with an upbeat message about the program. The videos are shown to soldiers who will use the facility for training, so they will understand why they have to bring the land back as closely as possible to what it was before the training. This is just good land management.

The AEARC tries to present it as a mission issue instead of an environmental issue and let the environmental part be transparent. **The AEARC** tells the environmental people that our primary mission, after all, is training soldiers. At Fort Irwin and Fort Polk, they put together a package that can be shown to all soldiers before they come there on rotation -- a package from both the operations and the environmental people. It helps if you know what to expect.

After **the AEARC** covers the kinds of things that affect everyone, they move into the details for that particular installation. It is the details that make it necessary to develop installation specific videos, rather than one Army-wide video that can be used everywhere.

The AEARC borrows the SOP to write the video script. We put in phone numbers, information about what's off limits, whatever will make the integrated training-land management program go as smoothly as possible.

Figure 4-4. AEARC Tips on Developing ITAM Videos.

With today's most effective type of media being television, a video that teaches soldiers about the environment in which they live and train is a very effective training tool.

The seven steps to develop an EA video:

1. Determine your audience.

   United States Army Soldiers that train on your installation and/or civilians.

2. Determine your goals and objectives.

   Goals: informative, accurate, fast-paced, entertaining

Objectives or topics you want covered: installation history, natural resources, off-limits areas, endangered species, maneuver damage prevention measures, and special topics, like "What is ITAM?"

3. Hire a production facility to write script, take video footage, edit video footage, build graphics, and do narration and music (may do in-house or contract out based on funding).

4. Determine your costs.

   Approximately $1,000/minute of finished tape. The number of topics covered will determine this and how much money you have in your budget. Obviously, if you only have $10,000 in your budget for a video, then your video is only going to be about 10 minutes long.

5. Write the script and get command approval.

   - Start by providing an outline of the topics you want covered in your video and written material such as history books, natural resources information, historical and archeological information, soldier's and leader's handbooks, and the Range Regulation.

   - Once the script is written put together a short list and deliver it to your chain-of-command. Also, deliver to subject matter experts for their consent.

6. Take the video footage. Easy shots include historical buildings, static natural resources, existing maneuver damage, etc. Difficult shots include footage of military equipment, personnel, and battles. There are two ways to get these shots, 1. By getting lucky or 2. By being prepared. Contact Range Control to get permission to film battles and contact specific units to get shots of equipment and personnel. Other difficult shots include shots of aerial footage of the installation, endangered species, other wildlife, and the seasonal variation of field conditions.

7. Put it all together with graphics, voice, and music. The installation's GIS operator may be able to build maps of waterways, roads, off-limits areas, etc. Once the graphics are finished, start putting the footage together with the text and music.

4.4.3.2 Distribute EA Product

EA materials can be distributed through a variety of means and organizations, as listed below.

- Briefings to units. These can be standardized or customized to fit the audience. Types of briefings may include:

  - In-processing Briefings

- Pollution Prevention Briefings
- Newcomers Briefings
- Hazardous/Solid Waste Briefings
- Environmental Compliance Officer Training (NOTE: The National Guard uses the term "UECO" – Unit Environmental Compliance Officer)
- Range Safety Officer Briefings
- Company Commanders/1SG Courses
- Pre-camp Conferences
- Commander Conferences
- On-site briefings.

- Written materials can be distributed at:
  - Welcome Centers
  - Information Kiosks
  - Any place where soldiers congregate
  - Dining Facilities
  - Ranges
  - Headquarters Buildings/Administrative Areas
  - Briefings
  - Reserve Component Home Stations.

Environmental awareness materials may also be distributed via local newspapers, television, radio stations, schools, and individual training sites – to include: TRADOC Schools, NCO Academy, etc.

4.4.3.3 Conduct Operational Awareness

(**NOTE**: **The content for this section is pending development.)**

4.4.4 Maximizing Benefits of an EA Program

To assess the effectiveness of the EA products and the methods by which the products are distributed, try some of the following ideas.

- Obtain Command emphasis and support of the EA program. Commanders must be intimately involved with and support the EA program. Command emphasis is necessary to convey the seriousness of environmental stewardship and provide focus for installation-specific issues. Command emphasis also conveys the priority and resolve needed to sustain Army lands, and ensure compliance with laws and regulations. Command support will come if you are visible and send out a mission compatible message. Installation and MACOM public affairs offices can help to proactively convey their command's program to both military and civilian audiences.

- Learn from soldiers. Spend time in the field with soldiers. Ask soldiers what they do and how they do business. Learn the culture and communicate with them using a commonly understood language. Use feed back to evaluate the effectiveness of EA products. Continue doing what works well and stop doing things that do not.

- Remain flexible. Be willing to talk to any audience and use any appropriate venue.

- Be aggressive. Work your way into environmental training classes and incoming soldier briefs. Establish display areas with information and publications in locations frequented by uniformed personnel.

- Open or maintain lines of communication with local government, retired military organizations, concerned citizen groups, etc.

- Incorporate the values of other land users into EA materials. For example, people that hunt, fish, boat, hike, and camp value clean water for fishing and mature forests for hunting. Develop EA materials for these people using images that hit home and convey the importance of stewardship.

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5.0 DECISION SUPPORT AND INFORMATION MANAGEMENT SYSTEMS

With the exception of GIS and ATTACC, the programs and systems described in this section are not directly part of ITAM. However, understanding their roles and functions are important to successful execution of ITAM -- especially the TRI component.

5.1 Introduction

There will be no cookbook recipe for mixing systems in a real world balancing of mission requirements with the environmental conditions of training and testing areas. A good land management program will involve coordinating, balancing, and arbitrating what will sometimes be conflicting positions that require sound people-skills as well as creative use of many programs and systems. As the “bridge” ITAM will often be the means to help link these together as part of sound land management in support of the Army mission.

The traditional ITAM Program focused on the more easily defined areas of monitoring, educating, and repairing. Consequently, TRI is the least mature of the ITAM components. As both the ITAM and Conservation Programs standardize monitoring and measuring methods, emphasis can shift from methods to improved decision support tools.

Improving the ability to reasonably predict impacts are essential to risk assessment and alternative analysis. Restationing a Brigade, issuing a new weapons system, or relocating a habitual training event due to noise impacts of urbanization are a few examples of changes that would require prediction of the changing impacts of land use. Answering questions like, “What is the impact of moving a field training exercise (FTX) 500 meters to the west?” through better predictive tools will help TRI.

5.2 Program and Systems Planning

Much of what we do within ITAM is part of a planning and execution process. The ITAM objectives of achieving optimal sustained use of land and implementing a management and decision process requires planning.

The information management and decision support tools that support ITAM Program planning and execution must be based on a reasonable and sound planning process.

- **R**equirements identification
- **A**sset capabilities determination
- **B**alance to determine shortfalls and excesses
- **E**valuate alternatives
- **S**olutions (recommended alternatives)

Figure 5-1. Five Planning Steps

Good planning and clear and objective analysis is challenging, especially when the planner faces controversy, politics, and preconceived answers. By simplifying the planning process to the five major steps in figure 5-1, it is easier to consider how each major planning systems relates to individual steps, multiple steps, or to the whole planning process. The Army planning process is requirements driven. It is the most important of the five major steps because without valid requirements, there is no justification for expending resources on further execution.

The ITAM Workplan is an excellent planning document in that it reflects a clear understanding of the training and testing requirements for land along with a good assessment of land condition. A consideration of the impacts of land use and maintenance practices aides in developing and evaluating alternative projects and actions to correct problems. Prioritizing the projects produces a plan to solve problems.

The planning process relies on a valid identification of requirements and a sound inventory of existing assets. Without these, subsequent analyses can only be flawed. Specific factors, procedures and related policies for quantifying doctrinal training land and range requirements are outlined in AR 210-21, *Range and Training Land Program*, Training Circular (TC) 25-1, *Training Land* and TC 25-8, *Training Ranges*. The supported force structure, the required training events, and annual iterations are used to calculate the training load and determine the training and testing land carrying capacity.

Requirements

An example of the complexity of the planning process is preparing for the force modernization changes in moving to Division XXI. The Division's authorized strength is reduced from approximately 18,100 to 15,700 soldiers. The new Armor Battalion will have 45 tanks instead of 58. The workload to calculate the changing requirements for facilities is huge. The Army not only has to plan for the end-state but also for a multi-year transition period as divisions are modernized one at a time. For training facilities the problem is compounded by the need to evaluate the training strategies that are more complex than the space requirements to bed down soldiers, tanks and their equipment. For example, to what level will the 45 digitized tanks have to do the job of the 58 older generation tanks and how do we provide range and maneuver land facilities required to train the new force?

The rules and definitions for development of a training assets inventory, including definitions to determine facility category codes, are based on AR 415-28, Real Property. It is important to be aware of the definitions for ranges and maneuver land in AR 415-28 since these are also used in all the systems described in the remainder of this section.

5.3 Real Property Management and Master Planning

Real property management and master planning are the responsibility of the Office of the Assistant Chief of Staff for Installation Management (ACSIM), with the DPW responsible at the installation level. The DEP and USAEC are part of the OACSIM. The training community supports property management and planning both through ITAM and the RTLP, i.e., AR 350-4 and AR 210-21, respectively.

HQDA uses the planning process in figure 5-1 to identify valid Military Construction Army (MCA), including range and land purchase and/or lease projects. Planning is also the first step in the PPBES cycle to generate real property and training facility resource requirements, as well vital infrastructure information used in stationing decisions.

5.3.1 Real Property Master Planning (RPMP)

RPMP is the process used by the Army to plan for the identification of facility requirements, the design and construction of new facilities, the maintenance of existing facilities, and the reuse or disposal of obsolete facilities. It includes long and short range plans, Tabulations of Facilities Required and Available (TAB), capital investment strategies, mapping of installations and surrounding areas, Installation Design Guides to unify the “look” of installation facilities, and a variety of supporting elements including traffic plans and inventories of historical properties. The ACSIM is the Army proponent for master planning.

The purpose of the RPMP addresses the planning process for over 300 types and categories if installation real property, including barracks, family housing, utility systems, industrial facilities, roads classrooms ranges and maneuver land. Planning quantifies the requirements for facilities to support an installation’s missions, evaluates the adequacy of existing facilities and proposes modifications, removals and additions, and provides a planning roadmap to address shortfalls and excesses. Large new-work projects identified in the RPMP compete at the MACOM, HQDA, DOD, and Congressional levels for Military Construction funding. Smaller projects are prioritized for RPMA funding.

Land is real property. It is a priceless non-renewable asset that has been “loaned” to the Army for use in supporting our national defense mission. Family housing, barracks, offices, roads, wilderness areas, live-fire ranges and maneuver areas are all real property assets “built” on land. A primary function of master planning is land use planning, or zoning, to balance compatible and incompatible land usage to meet industrial, residential and recreational requirements.

5.3.2 Range and Training Land Program (RTLP)

The ODCSOPS RTLP Program is regulated by AR 210-21. The primary RTLP functions are (1) standardizing and modernizing Army training ranges and (2) standardizing the Army training land acquisition process. The objective is to ensure that

ranges and maneuver land support the requirements to train soldiers realistically, in a manner consistent with current and future doctrine and force structure while addressing the impacts of new weapons systems and ammunition. The RTLP also regulates range operations, maintenance, and automation systems. For maneuver land, RTLP, RPMA, and the Natural and Cultural Resources Management Programs support the ITAM Program to manage land use, maintenance, and sustainment. At the installation level, the DPTM/G3/Tester is normally the RTLP proponent. Range Control is normally responsible for implementation.

The key RTLP planning product is an installation RTLP Development Plan (RDP). The RDP should define the range and training land requirements for use in the installation RPMP, INRMP, and ICRMP. These efforts, together with the ITAM Workplan, should produce a sound business approach for consistent and proactive management of training land balancing mission, infrastructure, and environmental stewardship.

The RPMP addresses all installation facility requirements while the RDP focuses on facilities requirements and range and training land planning. And while the RDP focuses on the "live training domain", it must consider Training Aide Devices, Simulators and Simulations (TADSS) in its alternatives analysis.

Installation RDP identify modernization projects which are then validated, prioritized and consolidated at MACOMs and HQDA to clearly identify Army-wide doctrinal range and training land requirements. The result, produced in conjunction with other measurement standards such as the Unit Status Report (USR) and ISR, is the Army Master Range Plan (AMRP), an Army approved prioritized list of range and training land projects for all categories of resourcing. These requirements in turn support development of the Army Future Year Development Plan (FYDP) and the Army budget development process.

The current political and regulatory climate makes new land acquisitions difficult, expensive and time consuming at best. Therefore the most important alternative in the planning process should normally be: "Best use of existing training land to support the mission." A strong ITAM Program is the keystone for realistic planning and execution of that alternative.

The RTLP Planning Initiative revitalizes the business practices in AR 210-21 and provides a more holistic, consistent, and deliberate process aimed at leveraging existing and future technological advancements to better balance mission, environmental, and infrastructure requirements within the constrained fiscal outlays expected for the 21st century. The RTLP provides an integrated business process to articulate the requirements for ranges and training land considering budget constraints and three major modernization and innovative processes: Force XXI, the *Installations: Strategy for the 21st Century,* and the *U.S. Army Environmental Strategy Into the 21st Century.*

5.3.2.1 Force XXI

The *Force XXI* program outlines the Army's process aimed at redesigning force structure and assessing how this new structure should be equipped, stationed, and trained to fight tomorrow's battles. Supporting this program, are two TRADOC visions - *Warfighter XXI* and *Warrior XXI*. The goal of these visions is to break old functional area paradigms and traditional ways of thinking and leverage technological improvements towards providing tough and realistic organizational (collective unit), institutional (individual), and self-development training.

5.3.2.2 The Installations: Strategy for the 21st Century

The *Installations: Strategy for the 21st Century* concentrates on four major issues - maintain the edge for a trained and ready force; reshape the force and support infrastructure into more productive and robust power projection platforms; resource the force more effectively and efficiently through adopting an entrepreneurial approach with the Army's local communities; and integrate the force based on the Total Force concept.

5.3.2.3 The U.S. Army Environmental Strategy Into the 21st Century

The *U.S. Army Environmental Strategy Into the 21st Century* provides the framework to ensure that environmental considerations are integral to the Army mission. In this effort, the Army has committed itself to a comprehensive environmental stewardship ethic focusing on compliance, restoration, prevention, and conservation. The initiative establishes the Army corporate vision, philosophy, and goals for meeting current and future environmental challenges, while collectively working towards protecting and maintaining the Army's number one priority - tough and realistic training.

5.4 Decision Support and Information Management Systems

5.4.1 Installation Training Capacity (ITC)

The Installation Training Capacity (ITC) database is a macro view of the "training sandbox" to provide a DA level view of current capability to support training. It contains an objective calculation of range and training land requirements using the RTLP methodology. (AR 210-21, TC 25-1 and TC 25-8 as described under above under Planning.) It also contains some more subjective measures of installation training capacity – Drop Zones (DZ), MOUT, and environmental factors. The purpose of ITC is to maintain a database that provides Army planners with accurate timely information concerning the training attributes of Total Army installations in the US.

5.4.2 Integrated Facility System (IFS)

The IFS is a facility engineer automated information evaluation system that encompassed life cycle management of real property resources, and is the ACSIM official source of real property information. Current version is the IFS – Micro or Mini

(IFS-M). In addition to real property information, the system performs a wide-variety of other functions such as work estimating and work-order tracking. There are two levels of the system: the installation level and the headquarters level (now called Executive Information System (EIS)). The USACE Center for Public Works (CPW) manages IFS.[10]

The rules for quantifying and cataloging real property assets are outlined in AR 415-28 Real Property Category Codes. The regulation and associated HOW-TO MANUAL define Facility Category Codes (FCC) and the units of measure (i.e. each, square foot, acre) for each type facility. Engineer, trainer and environmental communities should coordinate changes to the categories, definitions and units of measure to ensure that a reasonable common set of terms is available, especially when functions are to be automated.

FCC's are aggregated into approximately 335 Facility Category Group (FCG), based on common functional purpose and units of measure. Each FCG is defined by the make up of the category codes it contains. MACOM and DA level management systems normally do not manage data below the FCG level as the FCG level provides consistent and sufficiently detailed information for their decision support, planning and programming needs.

ITAM work will normally focus on the following Facility Category Groups:

173XX	Impact Areas
177XX	Maneuver Land
178XX	Training Ranges
179XX	Other Mission Related Training Facilities
390XX	Testing Ranges/Areas
851XX	Roads, Bridge and Tank Trails

5.4.3 Real Property Planning and Analysis System (RPLANS)

The RPLANS is an automated system designed to:

- Assist installation, MACOM and DA level planners in calculating a consistent, automatically updated set of installation TABs (Tabulation of Existing and

[10] Additional information is available on the CPW home page at http//www.usacpw.belvoir.army.mil for IFS and other facility engineer systems, as well as for the other real property management information.

Allowed or Required Facilities)[11] based on approved population data and planning criteria

- Provide capability to estimate construction and maintenance costs, including new construction, renovation, facility conversion, and increases in maintenance

- Provide a variety of additional facility analysis reports.

There are three versions of RPLANS. The first, RPLANS is centrally updated for changes in force structure and force modernization, as well as for allowing the user to do what-if drills for new or changed mission requirements. The Installation RPLANS is the OACSIM database of record for facility requirements. Lastly, HQRPLANS is designed to give macro analysis capability to HQDA and MACOM users.

5.4.4 Army Stationing Installation Plan (ASIP)

Army Stationing Installation Plan (ASIP) is the Army's official data source that relates current and planned training populations of all tenant and reserve organizational units to an installation to provide a basis for its real property planning and management support. Individual force structure elements are tracked by Unit Identification Code (UIC). The ASIP is updated semi-annually and assists installations to better manage and supervise manpower and equipment authorizations fed from other DA databases. These include the Department of the Army Authorization System (i.e., TAADS), Army Training Resources Requirements System (ATRRS), and Structure and Manpower Allocation System (SAMAS).

Key data elements of the ASIP include the current and projected Modified Table of Organization and Equipment (MTOE) and Table of Distribution and Allowances (TDA) of all activities and their associated training loads assigned to train at that installation.

5.4.5 Installation Status Report (ISR)

The Installation Status Report (ISR) is a senior decision-maker system designed to provide standardized reporting of installation capabilities and condition based on uniform Army-wide criteria. The system provides executive level information on the condition of installations. ACSIM is the proponent for ISR, however each agency should proactively work to ensure that their facilities and programs are accurately portrayed. The system includes three parts: Part I - Infrastructure, Part II - Environment, and Part III – Services. Together these three sections are designed to provide an overall picture

[11] **Allowances and Requirements**. Technically RPLANS automatically calculates what are called allowances. The user can accept these as default “requirements” or propose adjustments to the allowances for validation by higher headquarters. This capability provides necessary flexibility to minimize the workload for those areas where the allowances are adequate without inhibiting special situations.

of an installation's status, and show how deficiencies in installation condition affect the environment and mission performance.

ITAM is contained in Part I of the ISR. (i.e., the evaluation of maneuver land) ISR Part I is an evaluation in both quantitative and qualitative terms of all major facility groups, including ranges and maneuver land. ISR utilizes Real Property Planning and Analysis System (RPLANS) and Integrated Facility System (IFS) as the basis for quantitative measurement of facility shortfall and/or excess at installation level, with MACOM and Army-wide roll-ups. User evaluations, based on standard criteria, determine the qualitative portion of the ISR.

Because ranges and maneuver lands are included in this section of the ISR, the accuracy and effectiveness is of importance to the ITAM community. In fact, the establishment of an effective ITAM program is included as a qualitative factor for maneuver land. ISR results are also one of the criteria at the Range Modernization Resource Requirements Prioritization Board (RRPB).

Installation DPTMs are required to assess and rate the condition of training land. At present this is a subjective assessment. Beginning in FY 1999, ATTACC will be used to determine land conditions.

5.4.6 RTLP-Automation System (RTLP-AS)

RTLP Automated System (RTLP-AS) components are being developed or improved to assist Army planners, trainers, and operators in maximizing the use of available resources (manpower, time and dollars) associated with managing ranges and training land. To aid in standardizing the RTLP process, several existing and developing automated planning documents and systems together provide day-to-day operations as well as long term planning support. Some of these systems serve as centralized data bases for interactive or shared use with other DOD and DA decision support systems.

RTLP-AS configuration, which is regulated under AR210-21, is shown in Figure 5-2. The RTLP CCB coordinates integration or interface requirements for DOD and Army-wide systems with the appropriate service or department agent responsible for configuration management.

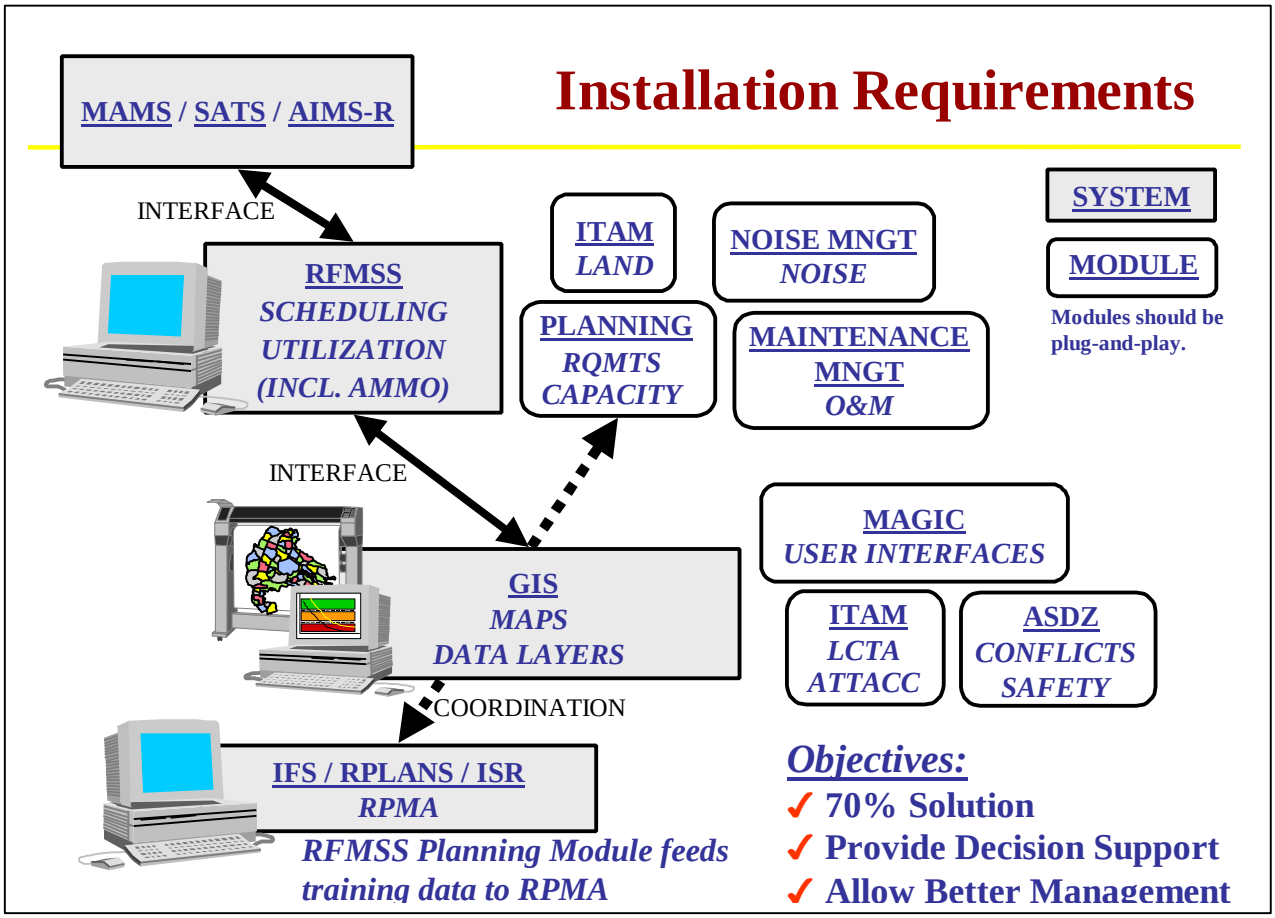

Figure 5-2. RTLP-AS Configuration.

The basic modules of RTLP-As are scheduling and fire desk operations. In addition to the basic tabular database management functions that are automated in RFMSS, the RTLP-AS includes a link to a commercial off-the-shelf GIS.

5.4.6.1 Geographic Information System (GIS)

A GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information. In the ITAM program, GIS technology is used to create, analyze, display, and print information about training land in support of training. Appendix M provides a functional description of a GIS.

Included in the RTLP-AS GIS concept are customized user interfaces to GIS such as the Military Activity GIS Interface Computer (MAGIC), an ITAM module which includes

ATTACC and LCTA functions, and the Automated Surface Danger Zone (ASDZ) module for creating surface danger zones associated with training events.

Additional GIS capabilities of interest included in the RTLP-AS concept are the ASDZ module and the Range Status Map. ASDZ allows users to create safety fans associated with each training event according to AR 385-63 and overlay them with other installation maps and data layers. The Range Status Map is a color-coded depiction of the firing status of each range and it's associated safety fans. For example, ranges that are occupied but are not in a firing status are depicted as green on the Range Status Map, whereas ranges which are in an active firing status are depicted as red.

While both the ASDZ function and the Range Status Map are of interest to ITAM users, they are considered as part of the Range Operations function as opposed to part of the ITAM Program.

The RTLP-AS includes commercial-off-the-shelf GIS capability, which is used to create, analyze, display, and print installation data layers and maps. In terms of ITAM, GIS is the cornerstone of the LCTA component; it is the tool that natural resource scientists use to analyze and evaluate the condition and capabilities of training land. However, GIS is also very important in realizing the TRI goals of the ITAM program because the information collected by the LCTA coordinator can be communicated to the trainer via the GIS. This supports the training planning and training scheduling processes.

5.4.6.2 Military Activity GIS Interface Concept (MAGIC)

A specific ITAM GIS application of the RTLP-AS is the MAGIC concept. MAGIC is an ArcView application that provides a controlled, simplified interface to GIS capabilities such as viewing and printing standard ITAM data layers and map-sets or performing standard analyses of geographic data. MAGIC capabilities are tailored to the **needs** of the user.

For example, military trainers use MAGIC to create, view, and print maps of training facilities in a "self-service" mode requiring little or no knowledge of the underlying ArcView system. This reduces the amount of time the ITAM staff spends creating maps and provides more flexibility to the trainer by allowing him/her to get the right information whenever it is needed.

MAGIC also supports tasks performed by the ITAM staff. The ITAM coordinator uses MAGIC to view the ATTACC MIMs status map and determine how the projected training load will affect land condition, while the LCTA coordinator uses MAGIC to develop ATTACC Land Condition Curves or access standard LCTA analyses. As GIS-related functions are developed within the ITAM program, those with Army-wide application will be embedded in MAGIC. This will ensure a standard GIS capability across the ITAM program. Appendix N provides further information on MAGIC.

5.4.7 Army Training and Testing Area Carrying Capacity (ATTACC)

The ATTACC analysis has been automated as a stand-alone tool for HQDA applications. TO make ATTACC useful for installation land management, elements of ATTACC have also been integrated into the automation tools most commonly available to ITAM and range control users. These tools consist of the Range Facility Management Support system (RFMSS) and the Arc View Geographic Information System (GIS), for which ITAM has developed a customized application called “MAGIC.” Because RFMSS and GIS/MAGIC are widely used to schedule and manage training land and facilities, the integration of ATTACC with these tools allows ITAM managers to apply the principles of ATTACC to directly support land management and scheduling decisions. Appendix L provides more information about ATTACC.

5.4.8 Range Facility Management Support System (RFMSS)

RFMSS is a multi-user, PC-based software package that automates the real property inventory, scheduling, firing (operations) desk, and management functions at an installation Range Control Center. RFMSS was developed to optimize the efficient scheduling, use, and operations and maintenance functions for an installation's live-fire ranges, maneuver training areas, and other related training facilities and assets under AR 210-21. RFMSS Version 3.1 is currently being fielded to numerous Active Army, Reserve Component and U.S. Marine Corps installations. RFMSS is scheduled for development as a SBIS module during FY97. This version contains numerous management enhancements to include improved interoperability functions with range safety and environmental prevention capabilities.

The functional proponent for RFMSS in HQDA, ODCSOPS Training Directorate (i.e., DAMO-TR). The executive agent for its implementation is the Combat Training Support Directorate, Ft Eustis, VA, and the functional manager for development and fielding is the RTLP Program Office and the Corporate Information Center of Missile Command (MICOM), both located in Huntsville, AL. Since its inception, several modules or applications have been added or under development that increases the data collection, storage, and analytical capabilities of RFMSS. A brief description of each modules follows:

- **Automated Surface Danger Zone (ASDZ)** application digitizes the range firing fans and surface safety fans for all of the Army's current and projected direct fire, indirect fire, and aerial delivery systems. These SDZs are contained in AR 385-63, Army Range Safety Program. ASDZ allows Range Control managers to better serve users in the planning and conduct of complicated combined arms live-fire and non live-fire training events.

- **Training Facility Inventory/Utilization (TFIU)** application is currently under development and will allow Range Control managers to input range facility and maneuver training area utilization data into a prescribed format outlined in the RTLP Range Development Plan Generic Methodology handbook. This automated

data application, under RFMSS, is expected to quantify facility usage data (electronically or manually) and perform the mathematical functions to determine the utilization trends for each range facility or training area by specific facility category code or facility category group. This application will also interface with the TRI application of ITAM for effective and efficient land management planning consistent with current and future environmental prevention considerations.

- **Range, Target, and STRAC Application (RTSA)** is currently under development at the Combat Training Support Directorate - the executive agent for RFMSS. This application is expected to automate the frequency of direct fire and indirect fire lane or firing points training requirements for specific MTOE and TDA units and activities. Training requirements for Organizational units will be based on STRAC resourced training events. Training requirements for Institutional training activities will be based on POI directed training events. RTSA is expected to capture weapons density authorizations in each unit/activity MTOE or TDA and determine the annual training requirements in lanes or firing points for each major direct or indirect fire weapons system. From these requirements definitions, installation range managers and program officials can predict and compare current and projected training requirement and utilization profiles to determine installation training range shortages and excesses.

APPENDIX A: RELATED PUBLICATIONS

A related publications is merely a source of additional information. The reader does not have to read it to understand this Department of the Army How-To Manual.

- AR 1-1 Planning, Programming, Budgeting, and Execution System
- AR 5-9 Area Support Responsibilities
- AR 10-5 Organizations and Functions, Department of the Army
- AR 11-2 Management Control
- AR 25-30 The Army Integrated Publishing and Printing Program
- AR 200-1 Environmental Protection and Enhancement
- AR 200-2 Environmental Effects of Army Actions
- AR 200-3 Natural Resources – Land, Forest, and Wildlife Management
- AR 200-4 Cultural Resources
- DA PAM 200-4 Cultural Reasources
- AR 210-20 Master Planning for Army Installations
- AR 210-21 Army Training Ranges and Training Land (implementing draft)
- AR 350-1 Army Training
- AR 350-4 Integrated Training Area Management
- TC 25-1 Training Lands
- TC 25-8 Training Ranges
- FM 25-100 Training the Force
- FM 25-101 Battle Focused Training
- Army Training and Testing Area (ATTACC) Handbook
- LCTA II January 1996 Report
- LCTA II August 1996 Report

- Remote Sensing Users Guide
- LCTA (USACERL) manual
- ELVS Final Report

APPENDIX B: ABBREVIATIONS

Appendix B provides a listing of abbreviations that includes office symbols, acronyms, and abbreviations commonly used throughout the United States Army and within the Integrated Training Area Management (ITAM) Program.

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
ACS-G3	Assistant Chief of Staff, Training	Table 2-2
ACSIM	Assistant Chief of Staff for Installations and Management	5.3
ADCSOPS	Assistant Deputy Chief of Staff, Operations and Plans	Table 2-2
AEARC	Army Environmental Awareness Resource Center	4.4.1.1
AMC	Army Materiel Command	2.5
AMRP	Army Master Range Plan	5.3.2
AMSCO/PE	Army Management System Code/Program Element	1.6
AMS	Army Management System	2.2
APP	Annual Program Plan	2.2
AR	Army Regulation	1.0
ARNG	Army National Guard	1.6
ARSTAF	Army Staff	2.1.1
ASIP	Army Stationing Installation Plan	5.4.4
ASDZ	Automated Surface Danger Zone	5.4.6.1
ATRRS	Army Training Resources Requirements System	5.4.4

[1] The “Defined in Section #” column is included to help with the review of DA PAM 350-4. Once HQDA finalizes the content of the document, the column will be eliminated.

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
ATSC	Army Training Support Center	2.1
ATTACC	Army Training and Testing Carrying Capacity	1.5
BLTM	Battalion Level Training Model	1.5
CAT	Category	2.4
CCB	Configuration Control Board	2.1
COC	Council of Colonels	1.6
COE	Chief of Engineers	2.1.4
CoFS	Chief of Staff	1.2
CONUS	Continental United States	2.8.1
CPW	Center for Public Works	5.4.2
CTSD	Combat Training Support Directorate (part of ATSC)	2.1.6
DA	Department of the Army	1.5
DAMO-TR	Training Directorate, ODCSOPS	2.1
DAMO-TRS	Training Simulations Division, ODCSOPS	2.1.1
DCST	Deputy Chief of Staff for Training	2.1.4
DOT	Director of Training	2.2
DEP	Director of Environmental Programs	2.1.5
DOD	Department of Defense	1.1
DPTM	Directorate of Plans, Training, and Mobilization	1.5
DPTMSEC	Directorate of Plans, Training, Mobilization**,** and Security	Table 2-2
DPW	Directorate of Public Works	1.6
DZ	drop zones	5.4.1

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
EA	Environmental Awareness	1.5
ECP	Erosion Control Plan	Table 4-1
EIS	Executive Information System	5.4.2
EMC	Executive Management Council	1.6
EQT	Environmental Quality Technology	2.6
ESMP	Endangered Species Management Plan	3.1.2
EUSA	Eighth United States Army Command	Table 2-2
FORSCOM	Forces Command	Table 2-2
FY	fiscal year	2.2
FYDP	Future Year Development Plan	5.3.2
GIS	Geographic Information Systems	1.5
GS	general schedule	2.5
HQ	Headquarters	2.1
HQDA	Headquarters Department of the Army	1.0
IAW	in accordance with	2.2
IWAM		
ICRMP	Integrated Cultural Resources Management Plan	3.1.2
IFS	Integrated Facility System	4.2.4
IFS-M	Integrated Facility System – Mini or Micro	5.5
IISC	ITAM Installation Steering Committee	2.1
INRMP	Integrated Natural Resources Management Plan	1.5
IPA	Intergovernmental Personnel Act	3.4.2

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
IPR	In progress review	3.6
ISA	Installation Support Activity	Table 2-2
ISR	Installation Status Report	2.1.6
ITAM	Integrated Training Area Management	1.0
JS	Joint Staff	2.1.1
LCTA	Land Condition Trend Analysis	1.5
LN	local national	2.5
LOI	Letter of Instruction	2.1.7
LRAM	Land Rehabilitation and Maintenance	1.5
MACOM	Major Army Command	1.6
MCA	Military Construction Army	5.3
MDEP	Management Decision Package	1.6
MEDCOM	Medical Command	Table 2-2
METL	Mission Element Task List	4.2.2
MICOM	Missile Command	5.4.8
MIM	Maneuver Impact Mile	1.5
MOUT	Military Operations on Urban Terrain	4.2.2.2
MTOE	Modified Table of Organization and Equipment	5.4.4
MWAM	MACOM Workplan Analysis Module	
NEPA	National Environmental Policy Act	Table 4-1
NGB-ARO	National Guard Bureau Operations, Training, & Readiness Division Office	Table 2-2
OACSIM	Office of the Assistant Chief of Staff for Installation	2.1

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
	Management	
OCONUS	Outside of the Continental United States	4.0
ODCSOPS	Office of the Deputy Chief of Staff for Operations and Plans	1.0
ODEP	Office of the Director of Environmental Programs	2.1
OMA	Operations and Maintenance, Army	1.6
OMAR	Operations and Maintenance, Army Reserves	1.6
OMARNG	Operations and Maintenance, Army National Guard	1.6
OPRED	Operational Readiness	1.6
OSD	Office of the Secretary of Defense	2.1.1
PAM	Pamphlet	1.0
PAO	Public Affairs Office	3.1.7
PC	Personal computer	4,2,2,3
PE	program element	2.2
PEG	Program Execution Group	2.2
PLS	Planning Level Survey	1.6
POM	Program Operation Memoranda	2.2
PMR	Program Management Review	2.1.2
PPBES	Planning, Programming, Budgeting, and Execution System	2.1.1
R&D	Research and Development	2.6
RDP	RTLP Development Plan	5.3.2
RDTE	Research, Development, Test, and Evaluation	1.6

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
RLO2	Four letter code for AMC testing MDEP	2.5
RPLANS	Real Property Planning and Analysis System	4.2.4
RPMA	Real Property Maintenance Account	2.6
RPMP	Real Property and Master Planning	1.6
RRPB	Resource Requirements Prioritization Board	4.2.4
RTLP	Range Training Land Program	1.5
RTLP-AS	Range and Training Land Program, Automated Systems	3.1.4
RTSA	Range, Target, and STRAC Application	5.4.8
RUSLE	Revised Universal Soil Loss Equation	4.1.5
SAMAS	Structure and Manpower Allocation System	5.4.4
SJA	Judge Advocate	3.2
SOP	Standard Operating Procedures	1.0
SRP	Site Rehabilitation Prioritization	4.1.2
TAADS		5.4.4
TAB	Tabulation of Facilities Required and Available	5.3.1
TADD	Training Aide Devices, Simulators, and Simulations	5.3.2
TATM	Four letter code for the ITAM MDEP	1.6
TC	Training Circular	5.2
TCM	Technology Configuration Management	2.1.8
TDA	Table of Distribution and Allowances	5.4.4
TECOM	Test and Evaluation Command	Table 2-2
TFIU	Training Facility Inventory/Utilization	5.4.8

ACRONYM or OFFICE SYMBOL	DEFINITION	Defined in Section #[1]
TRADOC	Training and Doctrine Command	2.1
TRI	Training Requirements Integration	1.5
TTPEG	Training Program Execution Group	2.2
TSSDS	TRI-Services Spatial Data Standards	3.1.4
UECO	Unit Environmental Compliance Officer	4.4.3.2
UFR	Unfunded requirement	3.5
UIC	Unit identification code	
US	United States	1.1
USR	Unit Status Report	5.3.2
USACE	United States Army Corps of Engineers	2.1.4
USAEC	United States Army Environmental Center	2.1
USAREUR	United States Army European Command	Table 2-2
USARC	United States Army Reserve Command	Table 2-2
USARPAC	United States Army, Pacific	Table 2-2
USATSC	United States Army Training Support Center	2-10
USMA	United States Military Academy	Table 2-2
VENC	Four letter code for the Environmental Compliance MDEP	2.2
VENN	Four letter code for the Army Conservation MDEP	2.2
VSCW	Four letter code for the Training Range Operations MDEP	2.2
WAM		

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APPENDIX C: GLOSSARY OF TERMS

Conservation - The maintenance of environmental quality and resources or a particular balance among the species in a given area. The resources may be physical (e.g., soil), biological (e.g., tropical forest), or cultural (e.g., ancient monuments).

Core Capability - A uniform land management level of performance, which is the basis for central HQDA ITAM resourcing within each installation category.

Cultural Resources - Historic properties as defined by the NHPA, cultural items as defined by NAGPRA, archeological resources as defined by ARPA, sacred sites as defined in EO 13007 to which access is afforded under AIRFA, and collections and associated records as defined in 36 CFR 79.

Environment - The complete range of external conditions, physical and biological, in which an organism lives. Includes social, cultural, and (for humans) economic and political considerations, as well as the more usually understood features such as soil, vegetation, climate, and food supply.

Environmental Awareness (EA) - The component of ITAM that educates land users on the impacts on mission and other activities to the installation training land environment with the intent of reducing these impacts when possible. EA applies to tactical units, leaders, and soldiers assigned to or using the installation; tenant activities; installation staff, including civilian employees; an other installation training land users including local populations, family members, etc.

Environmental Stewardship - The management and administration of the environment.

Environmental Sensitivity - The degree to which mission activities adversely impact training land and/or its ability to recover. Training land, which is more adversely impacted and/or less able to recover, is considered more environmentally sensitive.

HQDA functional proponent - The HQDA principal responsible for policy and oversight of a particular functional area.

Installation Categories - The association of an ITAM installation to a specific category is based on factors such as mission, training load and intensity, installation size, and environmental sensitivity to mission activity. Four categories establish the relative importance of land management requirements among ITAM installations; Category one is the highest priority.

Integrated Cultural Resources Management Plan (ICRMP) - A five year plan developed and implemented by an installation commander to provide for the management of cultural resources in a way that maximizes beneficial effects on

such resources and minimizes adverse effects and impacts without impeding the mission.

Integrated Natural Resources Management Plan (INRMP) - The installation Commander' s comprehensive plan for deliberately managing natural resources to attain and sustain stewardship requirements while optimizing primary activities, i.e., execution of mission operations, on mission land, and where compatible conducting secondary activities such as commercial forestry, hunting and fishing.

ITAM User Requirements - Installation, MACOM, and HQDA originated requests for support from the ITAM Program. ITAM user requirements fall into three categories: Environmental technical support, training, support and policy. The PMR process validates ITAM user requirements.

ITAM Workplan - A document describing the specific ITAM projects which an installation, MACOM, or ITAM EMC agency plans to execute over a 3-year period. The ITAM Workplans are used to develop DA ITAM budgetary requirements and are updated annually.

Land The soil, water, vegetation, airspace, and wildlife on maneuver areas, firing and test ranges, and impact/demolition areas.

Land Condition - The status of a parcel of land as determined by measurement of natural resource characteristics such as erosion rate or percent vegetative cover.

Land Condition Trend Analysis (LCTA) - The component of ITAM that inventories, assesses, and monitors the state of the training land natural environment and its suitability for mission activities. A component of ITAM that spot surveys and monitors the condition of the land to produce data related to the specifics of cause and effect relationships between mission, training, and/or testing activities and natural resources.

Land Rehabilitation and Maintenance (LRAM) - The component of ITAM that maintains and/or restores training land to a condition whereby it is useful for training.

Management controls - The rules, procedures, techniques, and devices employed by managers to ensure that what should occur as part of daily operations does occur on a continuing basis. Management controls within the ITAM Program include PMRs, the EMC, the COC, and the ITAM Annual Workplans.

Natural Resources - The physical (e.g., soils) and biological (i.e., living) resources associated with a particular geographic area.

Operational Readiness (OPRED) - A commonly used umbrella term encompassing all the resource requirements of a Modified Table of Organization and Equipment

(MTOE) or Table of Distribution and Allowance (TDA) unit as they are funded within one or more Management Decision Packages. OPRED includes the following subcategories: Operating Tempo (OPTEMPO) -Classes III (Fuel) and IX (Repair Parts); Indirect OPTEMPO, Training Ammunition, Training Infrastructure (including ITAM), Force Projection Platforms, and Flying Hours.

Planning Level Surveys (PLS) - A one-time comprehensive fence-to-fence survey of the natural resources on given areas of an installation. The PLS supports natural resource management and integrated natural resource management plans. The ITAM Program does not resource PLS, but PLS data are used in the LCTA process. Installation wide inventories to characterize essential components of the installation natural resources -- land form, soil, water, and biota. The kinds, locations, and sensitivity of the resources serve as the foundation for environmental planning, including preparation of the INRMP.

Range and Training Land Program (RTLP) - The DA program for the operational management of ranges and training land as defined in AR 210-21. RTLP functions include the identification of training facility requirements and day-to-day range operations activities such as scheduling.

Realistic Training - Training that integrates all the conditions a unit or soldier would encounter in a military operation. ITAM maintains land conditions that support realistic training.

Resource Model - The process by which the HQDA functional proponent determines how to effectively distribute funds in a fair and consistent manner. The ITAM resource model provides a framework for funding a core capability at each installation based on that installation' s ITAM category.

Training - The entire range of mission activities which require, and/or affect "training lands." In that regard, the ITAM policy applies to the test, and maneuver activities conducted on Army Materiel Command (AMC) installations.

Training land - Lands used for both training and testing.

Training Land Carrying Capacity - The amount of training that a given parcel of land can accommodate in a sustainable manner with a reasonable and prudent level of maintenance and rehabilitation. The optimum capacity is a balance of usage, condition, and level of maintenance.

Training intensity - The level of magnitude of mission activity as determined by the type of unit, the training activity, the duration or frequency of occurrence, and the number of troops, vehicles, and weapon systems.

Training Requirements Integration (TRI) - The component of ITAM that facilitates training land management decisions that meet both mission requirements and natural resource conservation objectives.

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APPENDIX D: FISCAL YEAR 1998 ITAM Installation Steering Committee (IISC) Letter of Instruction (LOI)

Appendix D contains the fiscal year 1998 Letter of Instruction (LOI) for the Integrated Training Area Management (ITAM) Installation Steering Committee (IISC).

DAMO-TRS

MEMORANDUM FOR: SEE DISTRIBUTION

SUBJECT: Fiscal Year 1998 Integrated Training Area Management Installation Steering Committee (ITAM IISC) Letter of Instruction (LOI)

1. References:

a. ITAM Strategy, Training Simulations Division, ODCSOPS, HQDA, 17 Aug 95

b. Message; Subject: Land Rehabilitation and Maintenance (LRAM) Conference, DAMO-TRS, HQDA, Aug 95.

2. Purpose: The purpose of this document is to sanction and define responsibilities for an Integrated Training Area Management ITAM Installation Steering Committee (IISC), and to establish the scope of, and procedures for conducting, the annual ITAM Installation Workshop.

3. Background:

a. The ITAM IISC and ITAM Installation Workshop originated with the Land Rehabilitation and Maintenance, or LRAM, steering committee and workshop. In 1992, Army Natural Resource Management (NRM) staff identified the need for a workshop where installation staff could come together and share information relating to LRAM projects. The first LRAM Workshop was held at Fort Sill, Oklahoma to address that need. The workshop was well attended, and there was general consensus that it should become a yearly event. A group of attendees agreed to accept the responsibility for planning future workshops, and thus formed the initial LRAM Steering Committee. Additional workshops were held at Fort Carson, 1993; Aberdeen Proving Ground, 1994; Fort Rucker, 1995; and Fort McCoy, 1996.

b. In Fiscal Year 1994, the Army began to transfer responsibility for the Integrated Training Area Management (ITAM) program from the Office of the Assistant

Chief of Staff for Installation Management (OACSIM) to the Office of the Deputy Chief of Staff for Operations and Plans (ODCSOPS). ITAM proponency resides in the Training Simulations Division, ODCSOPS (DAMO-TRS). Since LRAM was and is a component of the ITAM program, Training staff attended both the 1994 and 1995 LRAM Conferences. It was evident that the conference and steering committee were valuable vehicles for achieving improvements to the ITAM program. It also was evident that the Workshop and Steering Committee should be sanctioned by the proponent (ODCSOPS - DAMO-TRS) to give them full authority to continue their work initiated in 1992; and that the scope of both the workshop and steering committee should be broadened to include all four components of ITAM; as well as key aspects of Army conservation and land management.

c. The need to sanction and broaden the scope of the workshop and steering committee were approved by the ITAM Council of Colonels on 6 Feb 96. The next ITAM Installation Workshop, held at Fort McCoy, WI, in Aug 1996, was the transition workshop as the original LRAM focus evolved to the full ITAM program.

4. Concept: The following provisions outline the scope and concept of operations of the ITAM Installation Workshop and ITAM Installation Steering Committee.

a. The ITAM Workshop is held on an annual basis to facilitate the sharing of lessons learned and new technologies that enhance Army and DOD land management practices.

b. Installation input and direction for the workshop is managed through an ITAM Installation Steering Committee (IISC).

c. The workshop supports the Army's ITAM program by:

(1) Providing a forum for reinforcing the Army's ITAM policies and procedures, and improving the management of training lands through Conservation best management practices.

(2) Providing a forum for scientific exchange of technologies, ideas, experiences, and lessons learned that relate to the application of ITAM on military training and testing lands.

(3) Providing input on requirements if requested by the ITAM Council of Colonels.

(4) Facilitating areas of integration among the Army's ITAM Program, Range and Training Land Program (RTLP), Conservation Program, and master planning.

d. The IISC coordinates the annual workshop to achieve the above goals. The committee operates, and the workshop is conducted, within the context of the Army's ITAM program management structure as described in the ITAM Strategy. As such, it has no authority over installations outside the formal chain of command (i.e., HQDA to MACOM HQ; and MACOM HQ to installations).

e. The IISC performs one significant additional function. It meets once annually to provide feed back to the Army's Conservation Research and Development community represented by the US Army Construction Engineering Research Laboratory (USACERL) concerning on-going conservation research projects.

5. Procedures:

a. The IISC is composed of 15 members, as follows:

(1) Ten installation representatives distributed generally as follows:

FORSCOM		2
TRADOC		2
USARPAC		1
USAREUR		1
AMC		1
NGB		1
USARC		1
MEDCOM, MDW, MEDCOM, EUSA	(rotating)	1

(2) Two MACOM HQ representatives from the above MACOMs.

(3) One Corps of Engineers Laboratory representative.

(4) One individual, each, from the Combat Training Support Dir, Army Training Support Center (ATSC-CTS, ITAM Executive Agent), and the Conservation Branch, Army Environmental Center (AEC, ITAM Technical Support

Agency). The latter two serve as non-voting representatives. A representative from each of the other military services may also participate as non-voting representatives.

(5) Initial IISC membership consists of members of the LRAM Installation Steering Committee, as of 1 August 1996.

b. Committee term Limits:

(1) Voting members serve a four-year term. Three members rotate out of the voting membership of the committee each year. Based on that rotation, the entire voting membership of the committee will turn over every four years. Vacancies occurring through resignation of a member will be filled through nomination of a new member at the next meeting. New members so nominated, will serve the remainder of the term of the resigned member. (Exception to the four-year rotation: The committee chairperson and vice-chairperson will be removed from the rotation schedule if their elected term exceeds the regular rotation. The outgoing chairperson will serve in an advisory capacity for one year after their term of office. If the term exceeds the four-year rotation, the advisory term will be served as a non-voting member of the committee.)

(2) New members are nominated by the current voting members. The ten installation members should equitably represent all MACOMs with ITAM programs (see para 5a(1)), and all four components of the ITAM program. New nominees are recommended to MACOMs through the ITAM PMR process.

(3) Participation will be viewed as an official duty, and new members must be able to make a serious commitment to active participation in support of the planning of future workshops. Once nominated (per paragraph 5b(2), above), the appointment of an individual to the steering committee must be approved by that individual's supervisor, and their parent MACOM HQ. A representative from the installation hosting the upcoming workshop will be designated as one of the new members each year.

(4) The IISC Chairperson has the lead responsibility for planning the workshop with input from all committee members. The chairperson is elected by the IISC membership. The term of office of the Chairperson is one year. A new committee Vice Chairperson is elected by the existing committee at the annual workshop. He or she will assist the Chairperson with the correspondence and planning for the next workshop, and will serve as the Chairperson the following year.

(5) The ATSC-CTS and AEC non-voting members are appointed by their respective agencies and serve for terms as determined by those agencies.

c. Committee Responsibilities and Procedures for Coordinating the ITAM Workshop:

(1) The committee is responsible for planning and executing the annual workshop. A call for papers is distributed to all military services, Army MACOMs, individuals who have attended prior workshops, and individuals expressing an interest in the workshop. The committee Chairperson provides workshop information to the Chief Conservation Officer for the Army, Navy, Air Force, and Marine Corps, and requests their endorsement to their respective commands and installations.

(2) The chairperson also coordinates information on the workshop with the ITAM Project Officer in DAMO-TRS for official endorsement of the workshop to Army MACOMs and agencies. DAMO-TRS will work closely with its ARSTAF counterpart (DAIM-ED-N) to ensure the workshop is accomplished in the best interests of training execution accomplishment and responsible environmental stewardship. Information concerning the upcoming workshop is also disseminated to MACOMs through the ITAM Program Management Reviews (PMR).

(3) Workshop topics, individual presentations, site and date for future workshops, and committee membership are issues coordinated by committee members. Topics for discussion may be nominated by either voting or non-voting members. Issues requiring a vote are determined by a simple majority. The non-voting ATSC-CTS and AEC members nominate topics from the ITAM PMR and/or ITAM COC.

d. Committee Authority:

(1) The IISC works within the scope of the ITAM program management system described in the ITAM Strategy, i.e., the PMR, Executive Management Committee (EMC), and the Council of Colonels (COC). Actions of the IISC must be validated by the ITAM EMC, and approved by the ITAM COC.

(2) The IISC has no authority over or within the formal chain of command.

(3) The non-voting ATSC-CTS and AEC committee members serve as liaison between the ITAM program and the committee.

(4) The Chairperson attends ITAM PMRs to provide feedback on workshop execution, plans for upcoming workshop(s), to obtain further input from MACOM ITAM managers, and to report on Conservation R&D reviews (see paragraph 5k).

(5) Actions and recommendations resulting from workshops are submitted for consideration through the PMR process and do not supersede official Army ITAM policy.

e. IISC Subcommittees. The following subcommittees will normally operate within the IISC; however, the number and designation of these may be modified as deemed appropriate by the IISC:

(1) Hotel Coordination. Responsible for identifying to the host installation workshop requirements for number of meeting rooms, display rooms, vendor display rooms, and break-out room scheduling.

(2) Papers and Proceedings. Responsible for screening, approving and organizing papers for presentation at the workshop; and for all aspects of publication of the workshop proceedings.

(3) Announcements and Invitations. Responsible for developing the workshop announcement and invitations (to include those for vendors) and providing same to host installation for distribution.

(4) Host Installation Selection. Responsible for canvassing for and selecting host installations for future workshops.

(5) IISC Membership Nomination. Responsible for managing the nomination of new IISC members as stipulated in paragraph 5a and b, above, and identifying nominees to appropriate MACOM headquarters.

(6) R&D Coordination. Responsible for coordinating the annual Conservation R&D review (see paragraph 4e and 5k) with USACERL and IISC members.

f. Workshop Host Installations:

(1) Installations that have an active ITAM program are encouraged to host the workshop. The request to host must be supported by an installation letter request signed by the garrison commander or designated representative. The request must be endorsed by the MACOM headquarters for that installation. The request is addressed to the ITAM proponent (HQDA, ODCSOPS, DAMO-TRS).

(2) The ITAM proponent responds to the request in writing.

(3) Site selection will be determined two years in advance.

g. Scheduling and Agenda:

(1) The Workshop is normally held in the last week of August, or the first week of September of each year. The ITAM PMR (PMR FY XX-2) is conducted at the close of each workshop. The PMR is a business meeting for the ITAM EMC and MACOM HQ ITAM managers, only.

(2) The ITAM Installation Workshop, itself, consists of a general session including installation presentations, poster displays, a field site visit to the host installation, and the PMR for designated attendees, as indicated in paragraph 5f(1), above. The workshop will typically be conducted as follows:

Mon: Travel day

Tue: Opening and presentations/workshops

Wed: Field site visit - host installation

Thurs: Presentations/workshops continue

Fri: Installation attendees - travel day

AM ITAM PMR (designated attendees, only)

h. The IISC normally meets independently with the hosting installation in March prior to the annual workshop to conduct on-site coordination.

i. Vendor Participation:

(1) The IISC and hosting installation may make arrangements for vendor participation in the annual workshop.

(2) The decision of a hosting installations to allow a vendor display should include review and advice by that installation's Staff Judge Advocate (SJA).

(3) The term "vendors" for purposes of this LOI, means industry, academia, and private, non-profit organizations that have expertise in land and/or natural resource management.

(4) Vendor participation for purposes of this LOI means display of capabilities and products related to ITAM. Such displays will NOT be part of the agenda, but will be conducted in a separate display area available to participants over the course of the workshop.

(5) The Army, host installation or steering committee membership will not solicit or accept any fees associated with these displays.

(6) The Army, host installation or steering committee membership will not convey the impression of sponsorship or endorsement of any vendor capability or product associated with these displays.

(7) Vendor displays will normally be arranged through the facility (e.g., hotel) where the workshop will take place. Hosting installations conducting the

workshop on an Army installation may elect to provide a vendor display in the workshop facility on that installation.

(8) Costs associated with vendor displays, including but not limited to transportation to and from, set-up/tear-down, manning, etc will be borne by the vendor.

(9) The above provisions concerning vendor displays will not apply to participation by vendors who are under contract to the Army for a particular project and whose participation in the workshop is in direct support of that project. For example, a vendor supporting a specific study or service may give a briefing on the status of that project as part of the workshop agenda, given the approval of the Army agency sponsoring that study.

j. Funding:

(1) The IISC is authorized to solicit a workshop registration fee from attendees. The registration fee is to defray cost of the workshop facilities, reports distributed to attendees, and similar expenses. The registration fee may not be used to defray cost of items normally covered by per diem (e.g., meals, lodging, transportation). Attendees are not authorized to be reimbursed for personal items (T-shirts, hats, etc) and costs of personal items may not be included in the registration fee. Attendees are authorized to be reimbursed for the registration fee as part of TDY expenses IAW Joint Travel Regulations for military personnel, and Joint Federal Travel Regulations for civilian personnel. These limitations apply to personnel traveling at the invitation of the military and/or Federal Government.

(2) An allocation of ITAM funds will be made from HQDA through the ITAM Technical Support Agency (Conservation Branch, Army Environmental Center) to the hosting installation to cover expenses which have been approved by the HQDA ITAM proponent (Director of Training, ODCSOPS) during the workshop planning process.

(3) The hosting installation identifies ITAM Workshop requirements in it annual ITAM Workplan for the FY during which it will host the workshop for approval by the HQDA ITAM proponent.

(4) Any residual funds remaining following the Workshop, and actions resulting from the workshop such as publication of proceedings, are retained by the hosting installation.

k. IISC conservation R&D advisory role:

(1) The function of the IISC in reviewing on-going Conservation R&D is informal.

(2) The areas of R&D for which the IISC will provide input are: land capacity and land rehabilitation and maintenance.

(3) The IISC performs this review in conjunction with its annual March planning meeting.

(4) The review process consists of briefings by the USACE labs, coordinated by USACERL. USACERL provides read-aheads of these briefings to the IISC members not later than two weeks prior to the annual March meeting.

(5) IISC responsibilities are limited to verbal feedback during the briefings.

(6) The IISC provides an informal, verbal report regarding this review at PMR XX-1, each year.

6. Proponent: Proponent for this LOI is the Training Simulations Division, Training Directorate, ODCSOPS, HQDA (DAMO-TRS).

7. Review Cycle: This LOI is subject to review two years following the date of publication.

JAMES M. DUBIK

Brigadier General, GS

Director of Training

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HQ, USACERL

APPENDIX E: CONFIGURATION MANAGEMENT PROCESS STANDARD OPERATING PROCEDURE

NOTE: Include or reference the actual DAMO memo.

Appendix E contains the standard operating procedures (SOP) for configuration management (CM) of Integrated Training Area Management (ITAM) Geographic Information System (GIS).

1. Reference.

a. Memorandum, DAMO-TRS, Integrated Training Area Management (ITAM) Geographic Information System (GIS) Products and Services, 14 October 1997.

b. ITAM Technology Configuration Management Process diagram, attached.

2. Background. Many technologies, including GIS, provide powerful tools for improving the ITAM user's ability to make land management decisions at all levels. Many ITAM user requirements are technology related, and a variety of products and services are available or can be developed to address these requirements. However, selecting, acquiring, and/or developing technological products and services can be a complex and expensive undertaking for individual installations, and can result in varying capabilities across installations. A mechanism is needed to reduce the cost and complexity of integrating technology into the ITAM program that is both flexible enough to address installation specific situations while achieving standardization of capability where appropriate. Thus, a technology configuration management process has been established. A particular area of interest is integration and management of GIS technology and GIS application development to address ITAM user requirements.

3. Purpose. Establishment of a technology configuration management process ensures that technological capabilities are developed and used effectively and efficiently in the ITAM program.

4. Objectives. Provide technology to the field in support of user requirements for more efficient management of Army training land. The technology configuration management process provides a mechanism to:

a. Identify and/or validate ITAM user requirements having technological implications.

b. Evaluate existing commercial or government products and services that may address these requirements.

c. Oversee development of technological products and services.

d. Identify and recommend priorities for technology fielding requirements.

e. Identify and recommend priorities for resourcing technology requirements.

f. Recommend general management guidance and direction to the ITAM program on technology issues.

5. Key Entities

a. The Configuration Control Board (CCB)

(1) **General.** The CCB is a function of the ITAM Program Management Review (PMR). The CCB provides management oversight to ITAM technological requirements identification, development, and implementation.

(2) **Responsibilities**.

(a) Identify pertinent technological issues and user and technical requirements.

(b) Oversee the development of solutions to technological requirements through the CMWG and the ITAM executive and technical support agencies.

(c) Make management recommendations on technological issues.

(d) Present significant recommendations (e.g. fielding and resourcing requirements) to the ITAM Executive Management Council (EMC) for approval by the EMC or ITAM Council of Colonels (CoC).

(e) Establish and employ an electronic coordination and staffing procedure to maintain communications between formal meetings of the PMR.

(3) Membership.

(a) All PMR members, including DAMO-TRS, HQDA Office of the Director of Environmental Programs (ODEP), US Army Environmental Center (USAEC), HQ TRADOC combat Training Support Directorate (CTSD), and one voting member from each MACOM participating in the ITAM Program, i.e. AMC, TRADOC, FORSCOM, NGB, MDW, USMA, USAREUR, USARPAC, EUSA, USARC, and MEDCOM.

(b) Non-voting members from related organizations as appropriate (see paragraph 5.g.).

b. Configuration Management Working Group (CMWG)

(1) **General.** The CMWG coordinates the activities of the ITAM technical support and executive agencies, ITAM related GIS development, and the Regional Support Centers (RSC) in accordance with GIS management objectives defined by the CCB.

(2) Responsibilities

(a) Prepare and present information on technology issues, requirements, and recommended technical solutions for consideration by the CCB.

(b) Manage the activities of GIS development to ensure compliance with CCB and EMC objectives (CTSD).

(c) Manage the activities of the Regional Support Centers to ensure compliance with CCB and EMC objectives (AEC, NGB).

(d) Form ad-hoc User Working Groups (UWG) under the direction of CTSD to identify, develop, and/or refine technological user requirements.

(e) Form ad-hoc Technical Working Groups (TWG) under the direction of AEC to address technical aspects of requirements, products, and services.

(f) Prepare information on CMWG and CCB activities and decisions for the ITAM PMR, Executive Management Council, Council of Colonels, ITAM Workshop, ITAM Newsletter, ITAM Homepage, and other audiences as needed.

(3) Membership.

(a) Chair, CTSD (ITAM Executive Agent and ITAM GIS Development manager)

(b) Co-chair, AEC (ITAM Technical Support Agency and RSC manager)

(c) Representatives from Army, DOD, or Federal agencies with expertise or interest in a given technology (as required).

c. Technical Working Groups (TWG)

(1) **General**. Technical Working Groups apply specific expertise to address technical aspects of requirements identification and development.

(2) **Responsibilities.** In accordance with the specific tasking outlined by the CMWG:

(a) Provide research, analysis, advice and recommendations to the CMWG on ITAM technical issues

(b) Evaluate technical aspects of commercial and government off-the-shelf products and services

(c) Provide recommendations on technical issues related to GIS development.

(d) Provide recommendations on technical issues related to Regional Support Center activities

(e) Document activities and findings

(3) **Membership.** Members of technical working groups will include representatives from ITAM organizations, related organizations, technical agencies, and contractors with expertise in the specific issue under consideration. The CMWG will determine the chairperson and the appropriate individuals or organizations to include in coordination with the CCB as necessary. Installation representatives will be appointed by the MACOM.

d. User Working Groups (UWG)

(1) **General.** User Working Groups identify, develop, and/or refine the details of a particular GIS user requirement using a workable number of users.

(2) **Responsibilities.** In accordance with the specific tasking by the CMWG:

(a) Develop detailed technological user requirements from general requirements

(b) Develop new technological user requirements

(c) Evaluate technological products and services in terms of meeting user requirements

(d) Provide user input to GIS development.

(e) Provide user input to Regional Support Center operations

(f) Document activities and findings

(3) **Membership**. Membership will generally consist of 10 or fewer installation, MACOM, and/or HQDA representatives and will vary depending on the purpose of each user working group. The CMWG will determine the chairperson and the appropriate organizations to include in coordination with

the CCB as necessary. Membership will be based on familiarity with a given subject and to ensure broad representation of users across the ITAM program. Installation representatives will be appointed by the MACOM.

e. Combined Working Group. To facilitate development, the CMWG may chose to create a combined working group to address a particular issue considering both user requirements and technology development. Functions of the TWG and UWG would then be integrated for development for that issue.

f. Executive Management Council (EMC)

(1) **General.** The EMC ensures that actions and decisions resulting from the technology configuration management process are consistent with ITAM program objectives.

(2) Responsibilities.

(a) Provide program and policy guidance to the CCB and CMWG.

(b) Review CCB recommendations and decisions for consistency with overall ITAM program objectives

(c) Present significant CCB and EMC decisions and recommendations to the CoC

(3) **Membership.** The ITAM EMC consists of one staff-level representative from each of DAMO-TRS, ODEP, USAEC, and CTSD.

f. Council of Colonels (CoC)

(1) **Responsibilities.** The CoC provides final decisions on CCB and EMC recommendations regarding significant ITAM technological initiatives.

(2) **Membership.** The ITAM CoC consists of: Chief, DAMO-TRS; HQDA Director of Environmental Programs; Commander, USAEC; and Director, CTSD.

g. Related Organizations. Organizations which may participate in CCB, CMWG or working group activities would include Facilities Engineering branches of the Assistant Chief of Staff for Installation Management (ACSIM), and Corps of Engineers, agencies of the Army Range and Training Land Program, and Corps of Engineers R&D labs.

6. Process. (See attached diagram)

a. Installation and MACOM requirements, problems and issues will be submitted to the CMWG through the MACOM CCB/PMR representatives.

b. With guidance from and in coordination with the CCB and EMC, the CMWG will take actions as appropriate to execute the ITAM technological effort to meet user requirements and address problems and issues. This will often require the formation of working groups of subject matter experts to evaluate and recommend solutions.

c. The CMWG will report to the CCB and EMC at the ITAM Program Management Review (PMR) on the status of its actions and will make recommendations on ITAM technological user requirements and issues.

d. The CCB will review CMWG actions, make decisions, and provide guidance to the CMWG. The CCB will refer items to the EMC as necessary.

e. The EMC will review CCB and CMWG actions, provide guidance, and make decisions. The EMC will refer significant items to the CoC as necessary.

f. The CoC will make final decisions on all significant technology initiatives.

APPENDIX F: ANNUAL ITAM WORKPLAN

NOTE: ATSC WILL REFERENCE THE WAM (TARGET DATE IS FORM IMPLEMENTATION)

Appendix F includes an example of an installation's annual Integrated Training Area Manag submission for Fort ITAM. The example provides a summary worksheet as well as the details.

ITAM WORKPLAN SUMMARY SHEET FY: 99		INSTALLATION: Fort ITAM Prepared By: Larry Jantz			MAC Pho
		18%	5%	76%	1%
	TOTAL	LCTA	TRI	LRAM	EA
TOTAL REQUIRED FUNDING:	$1,377,500	$242,200	$75,000	$1,050,300	$10,000

MACOM FUNDING:

NARRATIVE SUMMARY: The workplan outlined above provides for the basic recurring training land monitoring and maintenar Fort ITAM. Emphasis of this plan focuses on minimizing and streamlining monitoring efforts, and maximizing training resourc supports tracked vehicle training.

	TOTAL	LCTA	TRI	LRAM	EA
MACOM VALIDATED FUNDING:	$1,247,500	$242,200	$75,000	$920,300	$10,000

MACOM COMMENTS:

	TOTAL	LCTA	TRI	LRAM	EA
EXECUTED FUNDING: FY 97	$0	$0	$0	$0	$0

COMMENTS ON EXECUTION:

ITAM WORKPLAN		**INSTALLATION:**_____ **Fort ITAM**	**MACOM:**____ **GR**
FY	Project Description:	**Prepared By:**_____ **Larry Jantz**	**Phone:**_____ **75**
Priority #__4____ Project # 99-03	Purchase of Satellite Imagery and Remote Sensing data to conduct change detection monitoring and maneuver damage assessments. Satellite images: 3 @ $7K each Aerial photos: 1 sets @ $20K each Analysis conducted by Battelle PNNL	Component Requiring Funding LCTA $150,000 TRI $0 LRAM $0 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $150,000 TRI $0 LRAM $0 EA $0	E LCTA $0 Remarks:
Priority 5 Project # 96-01	GIS database support maintenance. This project includes all maintenance costs associated with the GIS system. To include all hardware repairs, supplies, upgrades, and all software updates.	Component Requiring Funding LCTA $20,000 TRI $0 LRAM $0 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $20,000 TRI $0 LRAM $0 EA $0	E LCTA $0 Remarks:
Priority #___6___ Project # 97-3	Monitoring equipment maintenance (I.e. meteorological stations, soil moisture monitoring equipment, etc.)	Component Requiring Funding LCTA $5,000 TRI $0 LRAM $0 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $5,000 TRI $0 LRAM $0 EA $0	E LCTA $0 Remarks:

ITAM WORKPLAN FY		INSTALLATION:_____ Fort ITAM Prepared By:_____ Larry Jantz	MACOM:____ GR Phone:_____ 757
Priority #___7___ Project # 99-07	Project Description: Resource protection. This project provides all resource protection material (I.e., siber stake material)	Component Requiring Funding LCTA TRI LRAM EA $0 $2,500 $0 $0 MACOM Validation: _X__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA TRI LRAM EA $0 $2,500 $0 $0	Ex LCTA $0 Remarks:
Priority #___8___ Project # 99-08	Project Description: Culverts/fords: Installation/repair of 12 culverts and fords in TA's 2C, 2D, 3A & 8 to improve access to remote training areas and to decrease impacts to surrounding riparian areas and surface water quality.	Component Requiring Funding LCTA TRI LRAM EA 0 $0 $121,500 $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA TRI LRAM EA $0 $0 $121,500 $0	Ex LCTA $0 Remarks:
Priority #__9____ Project # 99-09	Project Description: Culverts/fords: Installation/repair of 8 culverts and fords within the Selah Creek and Burbank Creek watersheds to improve access to remote training areas, and to decreases impacts to surrounding riparian areas and surface water quality.	Component Requiring Funding LCTA TRI LRAM EA $0 0 $85,600 $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA TRI LRAM EA $0 $0 $85,600 $0	Ex LCTA $0 Remarks:

ITAM WORKPLAN		**INSTALLATION:**_____ **Fort ITAM**	**MACOM:**___ **GR**
FY		**Prepared By:**_____ **Larry Jantz**	**Phone:**_____ **757**
Priority #___10__ Project # 99-10	Project Description: Administrative assembly area repair. This project will provide hardening, shaping, and maintenance of existing site near Exit 11.	Component Requiring Funding LCTA $0 TRI $0 LRAM $350,000 EA $0 MACOM Validation: _X__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $0 TRI $0 LRAM $350,000 EA $0	Exe LCTA $0 Remarks:
Priority #___11__ Project # 99-11	Project Description: Realignment of secondary roads within the Cold Creek Watershed located within riparian areas. Total length to be realigned is 2 miles.	Component Requiring Funding LCTA $0 TRI $0 LRAM $130,000 EA $0 MACOM Validation: ___ V: Validated ___ VA: Validated Adjusted _X__ NV: Not Validated MACOM Validated Funding LCTA $0 TRI $0 LRAM $0 EA $0	Exe LCTA $0 Remarks:
Priority 12 Project # 99-12	Project Description: Road Closure: Closure of 10 Km of roads in the Hanson Creek warershed. These roads are safety hazards that prevent access and use of the area for training purposes. Upon completion of the project, the effected areas will be made available to training. Project will be performed by in-house efforts.	Component Requiring Funding LCTA $0 TRI $0 LRAM $8,000 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $0 TRI $0 LRAM $8,000 EA $0	Exe LCTA $0 Remarks:

ITAM WORKPLAN FY		INSTALLATION:_____ Fort ITAM Prepared By:_____ Larry Jantz	MACOM:____ GR Phone:_____ 757
Priority #___13__ Project # 99-13	Project Description: Fire protection well maintenance. This project provides service and materials required to maintain fire protection fire protection wells. Total number of wells to maintain is 17.	Component Requiring Funding LCTA $0 TRI $0 LRAM $5,000 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $0 TRI $0 LRAM $5,000 EA $0	Exe LCTA $0 Remarks:
Priority #____14_ Project # 99-14	Project Description: Equipment maintenance (heavy equipment and resoration equipment). This includes all repair parts and labor.	Component Requiring Funding LCTA $0 TRI $0 LRAM $10,000 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $0 TRI $0 LRAM $10,000 EA $0	Exe LCTA $0 Remarks:
Priority #__15___ Project # 99-15	Project Description: Administrative Support Materials for the ITAM program	Component Requiring Funding LCTA $0 TRI $500 LRAM $0 EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $0 TRI $500 LRAM $0 EA $0	Exe LCTA $0 Remarks:

ITAM WORKPLAN		**INSTALLATION:**_____ **Fort ITAM**		**MACOM:**____ **GRA**
FY99		**Prepared By:**_____ **Larry Jantz**		**Phone:**_____ **757-**
Priority #__1___ Project # 99-01	Project Description: Salary (Contract) for: 1. ITAM Coordinator (TRI, through CSU)** 2. GIS Operator (LCTA, through GSA) 3. LRAM Technician: $58K (CSU)** ** Note: CSU is through Norfolk District COE.	Component Requiring Funding LCTA $60,000 / TRI $63,000 / LRAM $116,000 / EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $60,000 / TRI $63,000 / LRAM $116,000 / EA $0	Exe LCTA $0 Remarks:
Priority #__2___ Project # 97-02	Project Description: GSA vehicle rentals to support ITAM program: LCTA: 1 permanent vehicle LRAM: 7 permanent vehicles TRI 1 permanent vehicle (ITAM Coodinator)	Component Requiring Funding LCTA $6,000 / TRI $6,000 / LRAM $53,000 / EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA $6,000 / TRI $6,000 / LRAM $53,000 / EA $0	Exe LCTA $0 Remarks:
Priority 3 Project # 99-02	Project Description: Upland Restoration (reseeding) Projects: Reseeding of 4,000 acres following maneuver training across the installation.	Component Requiring Funding LCTA $0 / TRI $0 / LRAM $100,000 / EA $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA / TRI / LRAM $ 100,000 / EA	Exe LCTA $0 Remarks:

ITAM WORKPLAN FY		INSTALLATION:_____ Fort ITAM Prepared By:_____ Larry Jantz	MACOM:____ GRA Phone:_____ 757-
Priority #___16__ Project # 99-16	Project Description: Reproduction of Environmental Awareness maps for continued distribution to all using elements.	Component Requiring Funding LCTA TRI LRAM EA $0 $0 $0 $10,000 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA TRI LRAM EA $0 $0 $0 $10,000	Exe LCTA $0
Priority #___17__ Project # 99-17	Project Description: Realignment of approximately 2 miles of road within Training Areas 2C and 3A. This project is necessary to move the road out of the stream channel and re-establish streambed and bank integrity.	Component Requiring Funding LCTA TRI LRAM EA $0 $0 $170,000 $0 MACOM Validation: _X__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA TRI LRAM EA $0 $0 $170,000 $0	Exe LCTA $0 Remarks:
Priority #__18___ Project # 96-9	Project Description: TDY to ITAM and professional education meetings.	Component Requiring Funding LCTA TRI LRAM EA $1,200 $3,000 $1,200 $0 MACOM Validation: _x__ V: Validated ___ VA: Validated Adjusted ___ NV: Not Validated MACOM Validated Funding LCTA TRI LRAM EA $1,200 $3,000 $1,200 $0	Exe LCTA $0 Remarks:

APPENDIX G: STANDARD ITAM WORK CATEGORIES

NOTE: AEC/ATSD WILL UPDATE THE WORK CATEGORIES

G.1 Land Condition Trend Analysis (LCTA) Work Categories

Work Area **Work Category**

Plot Management

1. LCTA Coordinator: Salary for LCTA coordinator.
2. LCTA Field Crew/Plot Establishment/Monitoring: Salaries for field crews; costs of contracted monitoring; includes costs associated with establishment of plots.
3. Database Management and Analysis/Reports: Costs associated with maintenance and analysis of plot data. Includes costs for generation of analytical reports reflecting plot data.
4. Special Use Plots: Costs for establishing special use plots.
5. LCTA Modification: Costs for applying installation-specific modifications to standard LCTA plot methodology.

Note: Above will evolve to reflect LCTA II methods as they are finalized.

Geographic Information Systems (GIS)

6. External GIS Support - Installation/ Regional: Costs for obtaining GIS support from a central system at installation level or from a regional center or source.
7. GIS Equipment - HW/SW; Integrated Logistics Support (ILS) and/or Contracted Logistics Support (CLS): Costs associated with acquisition of GIS equipment, to include hardware and software. Costs associated with ILS or CLS of GIS equipment.
8. GIS Technician: Salaries for GIS technical staff.
9. Data Layers/Maps & Map Production/ Imagery/GIS Data Management: Costs for acquiring GIS data layers,

management of GIS data, acquiring other imagery, and acquisition and/or production of maps.

Data Collection (Non-plot) - This area relates to all data collection efforts not associated with or based upon the standard LCTA plot methodology.

10. Cultural/Archaeological Surveys: Costs of gathering cultural resource data needed to make TRI decisions or to assess cause/effect relationships relevant to training activities. This does NOT include baseline or comprehensive installation-wide cultural/archaeological surveys. This does apply to collection provided by an outside agency (either public or private) contracted to accomplish the above.

11. Non-LCTA Protocol Natural Resource Management (NRM) Surveys: Costs for a variety of NRM surveys outside the parameters of the standard LCTA methodology, but needed to make TRI decisions or to assess cause/ effect relationships relevant to training activities. This does NOT include baseline or comprehensive installation-wide natural resource surveys. This does apply to collection provided by an outside agency (either public or private) contracted to accomplish the above.

12. Erosion Surveys: Costs of conducting surveys focusing on erosion. This does NOT include baseline or comprehensive installation-wide erosion surveys. This does apply to collection provided by an outside agency (either public or private) contracted to accomplish the above. Costs of erosion monitoring devices and equipment.

13. Cameras/Imagery Equipment: Costs of acquiring or leasing cameras and imagery equipment to be used at the installation.

Miscellaneous

14. Non-GIS Equipment: Costs for leasing or acquiring equipment, including vehicles, but not including other than GIS, cameras/imagery, weather and GPS) associated with survey efforts.

15. Personnel Training: Costs of training personnel on tasks and skills associated with resource surveying and monitoring, GIS, imagery, etc.

16. LCTA Supplies: Costs of miscellaneous supplies needed to perform survey and monitoring functions - including supplies needed to carry out the standard LCTA methodology.

17. Weather Station: Costs of acquiring, leasing, operating and maintaining weather monitoring equipment.

18. GPS Equipment: Costs associated with acquiring, leasing, and maintaining GPS equipment.

19. LCTA Carrying Capacity: Costs associated with installation-specific carrying capacity studies based on LCTA data.

Note: Above requirements should not be valid beyond FY 98 and will be replaced by the Army Training and Testing Area Carrying Capacity (ATTACC).

G.2 Training Requirements Integration (TRI) Work Categories

Work Area **Work Category**

Management

1. ITAM Coordinator: Salary for installation ITAM coordinator.

2. Management Operations:

   (a) Temporary Duty (TDY)/Training: Costs associated with participation in ITAM conferences and technical training for staff involved in ALL components of ITAM. ITAM Coordinator will review and recommend to Director of Plans, Training, and Mobilization (DPTM) approval/disapproval of all ITAM-related TDY and staff training.

   (b) Supplies, Maps, etc Office supplies, miscellaneous supplies to support the ITAM functions.

(c) Facilities: Costs associated with upgrades to facilities to support ITAM staff and technical functions (all ITAM components).

Automated Data Processing (ADP) and Systems

3. ADP Equipment - Hardware/Software: Acquisition, and support of ADP equipment needed for range operations functions related to ITAM.

4. Data Link – Local Area Network (LAN) - DPTM/NRM: Costs associated with establishing and maintaining a data link between the DPTM (Range Operations), and Environmental (NRM) offices.

5. Range Facility Management Support System (RFMSS) Hardware/Software: Costs of acquiring and/or upgrading RFMSS.

6. RFMSS Training and ILS and/or CLS: Costs of training installation ITAM personnel on the use of RFMSS. Costs of RFMSS, ILS, and/or CLS.

Miscellaneous

7. Equipment - vehicles, etc: Costs for acquisition and/or lease of vehicles associated with overall ITAM operations.

8. Equipment - Video/Other Cameras: Costs for acquisition and/or lease of non-vehicular equipment.

Note: There remains a duplication for cameras with requirements specified under LCTA. Assume that cameras listed under TRI are standard (35mm, etc) versus higher technology equipment listed under LCTA.

9. ITAM Workshop Host: Costs associated with hosting the Annual ITAM Installation Workshop.

G.3 Land Rehabilitation and Maintenance (LRAM) Work Categories

Work Area Work Category

Training Area/Range Development

1. Land/Soil Stabilization; General Maneuver Damage Repair; Hardstand: Costs of seeding, other small scale soil stabilization projects. Costs of general maneuver damage repair.

2. Hard Stands: Costs for constructing hard stands or hardened sites in the maneuver area.

3. Rehabilitation of Other Use Areas into Training Areas; Unexploded Ordnance (UXO) Clearing: Costs associated with converting land used for non-training or non-maneuver purposes to maneuver area. This can include some clearance of unexploded ordnance to create additional maneuver area.

   NOTE: The range rule requires that closed ranges be handled in accordance with Resources Conservation and Recovery Act (RCRA). Therefore, clearing ranges to create maneuver area, as described above, must acknowledge that such clearings do NOT create incompatible use, i.e. maneuver and firing are compatible. Cleared ranges are inactive but not closed. Such projects should undergo legal review at installation level.

4. Training Area Reconfiguration: Comprehensive projects that create new training capabilities on a given land parcel.

5. Tree Planting; Tactical Concealment Islands: Costs of creating tactical concealment islands involving planting and/or relocating significant stands of trees and/or other vegetation.

6. Maneuver Corridor/Area Development; Vegetation Clearing; other clearing: Costs of reducing maneuver/training inhibiting vegetation. Costs of creating maneuver corridors in high vegetation areas. Costs of clearing other natural or manmade material to open land to maneuver and training.

7. Road Closure/Rehabilitation to Training Area: Costs of closing range roads or range road segments and returning the land to natural condition to permit maneuver and training. Costs of reducing a degraded range road

(i.e., expanded width due to vehicles bypassing) to original configuration/dimensions.

Specialized Training Facilities

8. Petroleum, oil and lubricant (POL) Containment Structure; POL Training Site: Creation of structures to capture inadvertent POL spills at locations where there is specialized or concentrated POL related training.

9. Aircraft Hover Points; Landing Zones/pads: Costs of creating and maintaining hardened sites that preclude excessive wind erosion related to helicopter flight operations.

Water Projects

10. Stream Crossing Structures: Costs of building and maintaining stream crossing sites for vehicles to prevent erosion and sedimentation.

11. Bridging Site/Shoreline Repair: Costs of building and maintaining hardened sites on stream banks or shoreline where bridging training habitually occurs. Hardening of shoreline for habitual amphibious training.

Road Maintenance

12. Road Maintenance; Track Vehicle Crossings: Costs of constructing and maintaining range trails. Such trails will NOT be for public or administrative use. Includes costs of constructing and maintaining hardened crossing sites on range roads for use by tracked and tactical vehicles.

Soil Protection

13. Soil Rehabilitation: Repair of major eroded areas resulting from training or causing restrictions to training.

14. Erosion Control Structures: Costs of construction and maintenance of specific erosion control structures.

Training Area Closure

15. Training Area Discontinuation/ Rehabilitation: Costs of closing a training parcel and performing significant long term rehabilitation without expectation of returning the parcel to training use.

Fire Protection

16. Construction and maintenance of fire breaks directly associated with ranges or to restrict training area fires resulting from training activities. Cost of constructing and maintaining water wells used for range and training area fire protection. Does NOT include controlled burns or personnel costs for fire protection staff.

    NOTE: Real Property Management Account (RPMA) accounts DO cover fire protection, fire fighting equipment and staffs. NRM forestry account mentions fire protection. There is no specific mention of controlled burns, but will assume those are NRM functions based on MACOM input.

Project Design

17. Specified/Unspecified Project Design; Comprehensive Plans: Costs of performing design of specific LRAM projects. Costs of maintaining a standing LRAM design capability. Costs of developing comprehensive installation-wide LRAM plans.

Area Protection/Restriction

18. Fencing: Costs of fencing to prevent public intrusion and or to prevent military intrusion into environmentally sensitive areas. Includes cost of marking systems and materials such as “Seibert Stakes.” Does not include general fencing of installation external boundary. Does not include fencing of Threatended and Endangered Species (TES) habitat.

19. Archaeological Site Capping: Costs of construction of protective structures, to include capping with soil, to protect archaeological sites.

Support Structure/Miscellaneous

20. Plant holding Facility/Seed Collection: Costs of creating a seed repository for reseeding appropriate to installation or for maintaining a plant facility for revegetation appropriate to installation.

21. Inter-Agency Support: Costs of executing inter-agency support agreements with local, state of Federal agencies which have a direct bearing on training land management. These agreements cannot have a compliance provision, nor can they be associated with a compliance requirement.

22. Supplies for Projects: Costs of acquiring supplies and materiel needed and used on a recurring, general basis to perform LRAM work.

23. LRAM Coordinator & Work Crews: Salaries for the installation LRAM coordinator and for standing work crews not associated with a specific project, but which carry out a range and variety of LRAM projects. Includes costs of umbrella contracts for execution of general LRAM work as described above.

24. Equipment - lease & buy: Cost of acquisition and/or lease of equipment specially used to perform LRAM work.

G.4 Environmental Awareness (EA) Work Categories

1. Print Media: Cost of producing all types of printed EA products, including: soldier and leader cards; soldier and leader pamphlets; and posters.

2. Video/Automated Media: Cost of producing EA videos tailored to installation needs and production of scripts for installation-produced videos. Cost of producing automated EA products (computer, compact disk/read only memory (CD-ROM), etc).

3. Signs: Cost of producing and stocking EA signs for use in training areas.

4. Displays: Cost of producing and maintaining centralized installation EA displays.

5. Conduct Training: Cost of conducting installation EA training.

APPENDIX H: LRAM ACTIVITIES AND CRITERIA FOR BEST MANAGEMENT PRACTICES

H.1 Land Rehabilitation and Management (LRAM) Activities

The Army Training and Testing Area Carrying Capacity (ATTACC) Program collects data based on Land Rehabilitation and Maintenance (LRAM) practices funded through the ITAM Program. These practices are subdivided into two types: Repair and Sustain, as shown in Table H-1.

Repair practices are erosion related practices that directly affect the amount of erosion on Army training land. Sustain practices are non-erosion related practices and hence, do not directly affect erosion. (e.g., salaries, etc) Each Repair practice has a specific effectiveness measure that is normalized to a basis of one. Sustain practices are necessary for conducting LRAM business and have an effectiveness measure of 0.00 to denote no affect on erosion. Consequently, an effectiveness measure of .85 indicates that the maintenance practice will reduce soil runoff by 15 percent (1-.85=.15).

The quantity of each practice is collected using a specific unit of measure, as indicated in the "Unit" column. "Affected Acres/Unit Quantity" describes the number of acres that each practice affects with regard to erosion. A low, average, and high cost estimate for each practice is collected. This range of costs provide for the variable conditions on an installation due to weather, local economy effects, and physical location of the LRAM practice. The Total cost is a function of Quantity and Unit Cost. This information is collectively utilized to develop a cost benefit function to determine resource analysis.

Table H-1. LRAM Activities.

						Unit Cost			Total Cost		
Activity	**Type Practice**	**Effectiveness Measure**	**Quantity**	**Unit**	**Affected Acres/ Unit Quantity**	**Low**	**Avg**	**High**	**Low**	**Avg**	**High**
Aerial Seeding	Repair	0.73		Ac	1.00						
Band Fertilizer	Repair	0.68		Ac	1.00						
Blocking trails/fords	Repair	0.52		Ea	50.00						
Broadcast Fertilizer	Repair	0.73		Ac	1.00						
Broadcast Seeding	Repair	0.73		Ac	1.00						
Brush Plowing	Sustain	0.00		Ac	0.00						
Bulldozing	Sustain	0.00		Ac	0.00						
Burning	Sustain	0.00		Ac	0.00						

Table H-1. LRAM Activities.

Activity	Type Practice	Effectiveness Measure	Quantity	Unit	Affected Acres/ Unit Quantity	Unit Cost			Total Cost		
						Low	Avg	High	Low	Avg	High
Chaining	Sustain **and Repair**	0.00		Ac	0.00						
Chiseling	Repair	0.58		Ac	1.00						
Concealment Islands	Sustain	0.00		Ea	0.00						
Critical Area Treatment	Repair	0.68		Ac	1.00						
Diversion Ditches	Repair	0.65		ft	4.50						
Diversion terraces	Repair	0.70		ft	0.01						
Drill Seeding	Repair	0.73		Ac	1.00						
Dust Abatement	Sustain	0.00		Ea	0.00						
Equipment	Sustain	0.00		Ea	0.00						
Erosion Control Mgmt Plan	Sustain	0.00		Ea	0.00						
Establish Permanent Excavation Site	Repair	0.52		Ac	1.00						
Excavation/Fill Material	Repair	0.68		cy	0.50						
Fabrics & Netting	Repair	0.63		cy	1.00						
Filter Stripping	Repair	0.65		Ac	4.50						
Furrowing/Shredding	Repair	0.68		Ac	0.50						
Gabions	Repair	0.52		cy	1.00						
Grading & Shaping	Repair	0.68		cy	0.50						
Grass Sods	Repair	0.63		sy	1.00						
Grass Stolons, Rhizomes	Repair	0.63		Ac	1.00						
Grassed Waterways	Repair	0.65		Ea	4.50						
Gravel Road (Hill Access Point)	Repair	0.56		Ea	1.00						
Gravel/Rock Mulch	Repair	0.57		Ac	1.00						
Heavy use area: Bivouac	Repair	0.56		Ac	1.00						

Table H-1. LRAM Activities.

Activity	Type Practice	Effectiveness Measure	Quantity	Unit	Affected Acres/ Unit Quantity	Unit Cost			Total Cost		
						Low	Avg	High	Low	Avg	High
Heavy use area: Firing Points	Repair	0.56		Ac	1.00						
Heavy use area: Staging	Repair	0.56		Ac	1.00						
Heavy use area: Travel Lanes	Repair	0.56		Ac	1.00						
Herbicide - Foliar Aerially Applied	Sustain	0.00		Ac	0.00						
Herbicide - Foliar Ground Applied	Sustain	0.00		Ac	0.00						
Herbicide - Soil Active Aerially Applied	Sustain	0.00		Ac	0.00						
Herbicide - Soil Active Ground Applied	Sustain	0.00		Ac	0.00						
Hydroseeding	Repair	0.73		Ac	1.00						
Limestone & Gypsum	Repair	0.63		Ac	1.00						
Moldboard Plowing	Repair	0.59		Ac	1.00						
Non-Traditional Material	Repair	0.63		hr	1.00						
Offset Disking	Repair	0.58		Ac	1.00						
Paved Road	Repair	0.50		Ac	1.00						
Research Plots	Sustain	0.00		Ea	0.00						
Resource Management Plan	Sustain	0.00		Ea	0.00						
Rest Eroded areas	Repair	0.63		Ea	50.00						
Retaining Structures	Repair	0.68		Ac	0.50						
Riprap	Repair	0.52		cy	1.00						
Root Plowing	Sustain	0.00		Ac	0.00						
Salaries	Sustain	0.00		Ea	0.00						
Sediment Barriers: sediment fence	Repair	0.54		ft	15.00						
Sediment basins (Erosion Control/Sediment Ret Stru)	Repair	0.48		Ea	300.00						

Table H-1. LRAM Activities.

Activity	Type Practice	Effectiveness Measure	Quantity	Unit	Affected Acres/ Unit Quantity	Unit Cost			Total Cost		
						Low	Avg	High	Low	Avg	High
Sediment Traps	Repair	0.53		cy	0.50						
Shredding	Sustain	0.00		Ac	0.00						
Site Preparation	Repair	0.58		Ac	1.00						
Straw Mulch: Crimped	Repair	0.62		Ac	1.00						
Straw Mulch: Disked	Repair	0.62		Ac	1.00						
Stream Crossings	Repair	0.55		Ea	1.00						
Study	Sustain	0.00		EA	0.00						
Subsoiling	Repair	0.58		Ac	1.00						
Tandem Disking	Repair	0.58		Ac	1.00						
TDY	Sustain	0.00		Ea	0.00						
Terracing	Repair	0.68		ft	0.50						
Topsoiling	Repair	0.68		cy	0.50						
Trail	Repair	0.68		Mi	10.00						
Trees & Shrubs, bare root	Repair	0.63		plnt	1.00						
Trees & Shrubs, containerized	Repair	0.63		plnt	1.00						
Trenching	Repair	0.68		ft	0.50						
Water Quality Monitoring Station	Sustain	0.00		Ea	0.00						
Watershed Erosion Project	Sustain	0.00		Ea	0.00						
Weather Station	Sustain	0.00		Ea	0.00						

H.2 Criteria to Identify Best Management Practices (BMP's)

The LRAM coordinator is responsible for consulting appropriate manuals, State and/or Federal Agencies, Universities, etc. to identify best management practices (BMP)s. The generic criteria for identifying BMP's are as follows:

Based on installation specific conditions, those LRAM methods that when combined or implemented individually will:

- Achieve consistently successful results
- Provide cost effective, timely solutions in support of the LRAM program
- Conduct a comprehensive assessment of each project to ensure the maximum efficiency is gained with limited resources expended
- Lessons learned, as documented, should be cycled back into the decision making process for improvements on future LRAM projects.

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APPENDIX I: CORE AND OPTIONAL GIS DATA LAYERS

NOTE: AEC will provide further info on how to interpret the columns in the table

AND check to make sure that table is populated accurately.

Appendix I contains a listing of core and optional data layers for the Integrated Training Area Management (ITAM) Geographic Information Systems (GIS). Core data layers are a standardized requirement at all ITAM installations. The maintenance of this data should be considered a top priority effort. Optional Data layers provide additional information supporting ITAM management.

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
General:							
Aerial Photography	R	YES	C	X	X	X	X
Horizontal Control Points							
Bench marks	V	YES	O		X		X
Buildings/Facilities	V	NO					X
Usage	T						
Contour Lines	V	YES	C	X			
Digital Elevation Maps (DEM)	R	YES	C	X	X	X	X
Fire Breaks	V	YES	C		X	X	
Surface Type	T						
Width	T						
Maintenance Information	T						
Grid Scale	V	YES	C	X			
UTM	V						
Latitude/Longitude	V						

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Historic Impact Areas	V	YES	O		X		
Installation Boundary	V	YES	C				X
Political Boundaries	V	YES	C	X	X	X	X
County	V						
City	V						
Zoning, etc.	V						
Railroads	V	YES	C				X
# Spurs	T						
Cars per Spur	T						
Recreational Areas	V/T	YES	C				X
Roads	V	YES	C				X
By Type (Define)	T						X
With Bridge Classification	T						X
Culverts w/ Classification	T						X
Satellite Imagery	R	YES	O	X		X	
Slope	R/V/T	YES	O	X	X	X	X
Training Data:							
Accidents in Training Area	V	YES	O		Safety		
Date	T						
Type	T						
Synopsis	T						
Air Corridors	V	YES	C		X		

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Ammunition Holding Areas	V	YES	O		X		X
Capacity	T						
Artillery/Mortar Positions	S	YES	C		X		
Munitions Acceptable	T						
Survey Points	T						
Size	T						
Aviation Crash Maps	V	NO			X		
Constraints to Training e.g.	V	YES	C		X		
No Dig Areas	V					X	
Pipelines w/Crossing Sites	V/T						X
Noise Limitation Areas	V					X	
Limitations to Pyro Use	V				X		
Limitations to Obscurant Use	V				X		
Foot Traffic Only	V				X		
Crossing Sites/Ford Sites	V	YES	C		X	X	X
Unserviceable	T						
Unimproved	T						
Improved	T						
Hardened Sites	T						
DZ/LZ/PZ	V	YES	C		X		
Type	T						
Overall Dimensions	T						

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Length in Seconds	T						
Number of Ships by Type	T						
FAARP Sites, Prepared & Approved	V	YES	O		X		
Field Kitchen/Mess Sites	V	YES	O		X		
Gates w/Key Numbers	V/T	YES	O		X		
Hardened Training Sites	V	YES	C		X		
Heavy Equip Transport Sites	V/T	YES	O		X		
Impact Areas, Dudded	V	YES	C		X		
w/Buffer Zones							
Impact Areas, Non Dudded	V	YES	C		X		
w/Buffer Zones							
Land Navigation Courses	V	YES	C		X		
Laundry & Bath Sites	V	YES	O		X		
Loading Ramps	V	YES	O		X		
Maneuver Corridors	V	YES	O		X		
Maneuver Lanes	V	YES	O		X		
MOAs	V	YES	C		X		
No Overflight Areas	V	YES	C		X		
NOE Training Areas	V	YES	C		X		
OPs	V	YES	C		X		
Lines of Visibility	V						
Linked to Firing Positions	T						

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
POL Sites, Field	V	YES	C		X		
Potable Water Locations	V	YES	O				X
Ranges/Training Facilities	V	YES	C		X		
Facility Category Group	T						
FCG Description	T						
Category Code	T						
Cat Code Description	T						
Number of Lanes	T						
Left/Right Firing Limits	S						
Safety Fan/SDZ	V						
ROWPU Approved Sites	V	YES	O		X		
Telephone/MAG Sites	V	NO	O		X		
Telephone #	T						
Coordinates	T						
Trash Collection Sites	V	YES	O		X		X
Training Area Boundaries	V	YES	C		X		
ROWPU Approved Sites	V	YES	O		X		
Water Training Areas	V	YES	C		X		
Restrictions	T						
Depth	T						
Current	T						
Public Works:							

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Borrow Pits	V	NO					X
Building Floor Plans		NO					X
Fire Management Areas	V	YES	O		X	X	X
Fire Hydrants		NO					X
Flood Plains	V	YES	O				X
Landfills/Solid Waste Sites	V	NO					X
Major Work Orders		NO					X
Manholes		NO					X
MCA Projects		NO					X
Organizations w/in Bldgs		NO					X
Power Lines	V	YES	C				X
Height Above Ground	T						
Depth Below Ground	T						
Septic Drain Fields	V	NO					X
Towers/Antennas	V	YES	C				X
Height	T						
25 miles exterior of installation		NO					X
schools		NO					X
hospitals		NO					X
mass transit routes		NO					X
Mutual Aid Agreement sites		NO					Fire Dept
roads/water/basic stuff							X

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Utilities		NO					X
Wells & Monitoring Wells	V	NO					X
Environmental:							
Ag-Leasing	V	YES	C			X	
Archaeological/Cultural Sites	V	YES	C			X	
Cedar Clearing Opns	V/T						
Cemeteries	V	YES	C			X	
Endangered Species Sites	V	YES	C			X	
Erosion Control Structures	V/T	YES	C	X		X	X
Erosion Sites	V	NO		**X**		X	
Fire History	V	YES	O			X	
Dates	T						
Cause	T						
Type of Fire	T						
Percent Burned	T						
Acreage	T						
Forest Stand	V	NO				X	
Dominance	T						
dbh	T						
Stems Per Acre	T						
Age	T						
Forestry Opns/Logging	V/T	YES	O			X	

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Game Management/Hunting Areas	V	YES	O			X	
Species	T						
Number of hunters	T						
Dates Open to Hunting	T						
Harvest	T						
Geology/Geomorphology	V	NO				X	
Hazardous Material Location	V	NO				X	
Type of Material	T						
Quantity	T						
Herbicide/Pest Management Areas	S	YES	O			X	X
Date of Application	T						
Chemical Applied	T						
Historic Vegetation Cover	V	NO				X	
Hydrology	V	YES	C			X	
Rivers/Streams	V	YES	C			X	
Lakes	V	YES	C			X	
Wetlands Inventory	V	YES	C			X	
LCTA Transects/Plots	V	YES	C	X			
Type of Plot	T						
Monitoring Data	T						
LRAM Projects	V/T	YES	C	X			

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer
Date/Cost/Type	T						
Noxious Weed Infestation Areas	V	NO				X	
Permit Sites		NO				X	
Prescribed Burn Areas	V	YES	O			X	
Date	T						
Type Method Employed	T						
Acreage	T						
Sensitive Species	V/T	YES	O			X	
Soils	V/T	YES	C	**X**		X	**X**
Special Interest Natural Aeas	V	YES	O			X	
Vegetation Cover	V	YES	C	**X**		X	
Wildlife Food Plots	V	NO				X	

NOTES

1 In TYPE column, V=vector, R=raster, S=spatial, and T=tabular.

2 ITAM column. Yes means that ITAM will fund digitization of that data layer since those layers are useful to the ITAM program. No means that the responsible organization will either digitize the data or fund the ITAM program to do the digitization since these layers are normally not used for the ITAM program

3 An X under the organization means that that organization should fund the data collection for that layer

4 CORE/OPT Column. C=this data layer is considered, O=this data layer is optional at the discretion of the installation

5 Tri Service Standard naming conventions will be used for all ITAM digitized data layers and attributes when available in TSSDS. Rather, the attributes shown were felt to be important by one or more installations

6 There is not intent for the data layers under Public Works to be all inclusive or representative of all the data layers the DPW may need.

DATA LAYER	TYPE	ITAM	CORE or OPT	Responsible Organization			
				ITAM	DPTM	Envr	Engineer

7 Data layers and attributes may be combined in different manners depending on installation requirements/desires.

APPENDIX J: PRIORITIZED DATA ELEMENTS

The following is a prioritized listing for both LCTA collected and non-LCTA collected data. Non-LCTA data are data collected by another staff section on the installation, but which have relevance to the ITAM Program. Groupings of data include biotic, abiotic, land-use, and land management.

J.1 LCTA Collected Data in Priority Order

1 Vegetation status/condition (vascular/non-vascular)

2 Disturbance associated with various land uses

3 Vegetation coverage (vascular/non-vascular)

4 Floral inventories from land condition trend plots (vascular/non/vascular)

5 Soil conditions

6 Plant community descriptions and maps

7 Land use maps

8 Areas of active soil erosion by cause, training, recreational, wind, water, etc.

9 Variables necessary for estimating wind and water erosion

10 Avifauna

11 Mammals

12 Wildlife habitat associations

13 Herpetofauna

14 Fire fuel

15 Aquatic biota (benthics and macroflora)

16 Forage quality/quantity (wildlife or livestock).

Note: Numbers 4, 5, 6, 10, 11, 13, and 14 are data collected from trend condition plots.

J.2 NON-LCTA DATA:

J.2.1 Data from Range and Training Land Program (RTLP)

1 Military land use (type, duration, location, etc.)

2 Surface danger zones (firing points, etc.)

3 Military facilities (training and testing).

J.2.2 Real Property Management Activities (RPMA)

Infrastructure, roads, administrative and political boundaries, etc.

J.2.3 Data from Planning Level Surveys (PLS)

1 Topography

2 Soils

3 Wetlands, watersheds/surface waters, hydrography

4 Threatened and endangered species (TES) habitat and locations

5 Vegetation communities

6 Wildlife (fauna)

7 Flora

8 Cultural resources (generally predictive models).

J.2.4 Non-Military Land/Miscellaneous Land Use

1 Land management activities (prescribed burning, seeding, mowing, etc.)

2 Non-military land use (forestry, grazing, agricultural leasing)

3 Site specific cultural resources site data

4 Climatic variables (e.g., temperature, precipitation, wind, etc.)

5 Ecological disturbances/special circumstances (e.g., fires, insect or weed infestations, wind throw, etc.)

6 Historical natural resources information

7 Water quality

8 Noise

9 Geomorphology

10 Air quality.

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APPENDIX K: LCTA II METHODS

K.1 Land Condition Trend Analysis (LCTA) II

The term Land Condition-Trend Analysis (LCTA) originated with the methodology developed by the United States Army Construction Engineering Research Laboratory (USACERL) and is currently applied at a significant number of Army Installations. The original USACERL methodology includes provisions for sample survey design (including plot allocation) and plot sampling protocols for soils, vegetation, wildlife, and surface disturbance.

The LCTA program is the data collection and analysis component of ITAM. Methods of data collection used to conduct LCTA are not limited to the USACERL protocols, but encompass all valid techniques including remote sensing, in situ data collection, and use of data from other sources to meet installation needs for land management related information. The suite of LCTA II methods were developed as a result of user requirements. Generally, the adopted LCTA data collection method or combination of methods must provide a foundation to achieve LCTA program objectives.

K.2 LCTA II Sampling Methods

Tables K-1 through K-3 describe LCTA II sampling methods in terms of intended application, other potential uses, strengths, limitations, and additional notes. The descriptions are intended as a reference for LCTA program managers and others involved in the evaluation and selection of sampling methods. Note that each method described in the tables includes a scientific reference.

Table K-1. Primary LCTA II Data Collection Methods

	Point-Intercept (standard LCTA[1])	Line-Intercept	Daubenmire
Description	The line transect method involves an 1m rod lowered at 1m intervals along a 100m transect. The contact at ground surface is recorded, i.e. species, litter, etc. Canopy intercepts are recorded by the designated classes from ground level to 8.5 m. See density quadrats for a description of the belt transect methodology.	A measuring tape is stretched between two stakes or points and can be of any length. The intercept is recorded for each plant that intercepts the line. The accumulated length for any species divided by the length of the transect (tape) multiplied by 100 is expressed as percent cover for that species.	A 20cm x 50cm quadrat is used to estimate percent ground cover and is visually estimated as a vertical projection of a polygon drawn around the extremities of each plant. The projections are summed and recorded in a corresponding cover class. Six cover classes are used and converted to class midpoints for data analysis.
Intended Application	Ground and canopy cover	Canopy cover	Canopy cover
Other Potential Uses	Frequency, species composition, vegetation condition and trend	Frequency, basal diameter of species, density (Bonham 1989, p. 177), species composition, vegetation condition, and trend	Frequency, species composition, **ground cover, disturbance, vegetation condition and cover by strata,** and trend
Strengths	Objective, rapid and easily taught. Few surveyor decisions.	Canopy cover at different strata layers can easily be estimated. Equally adaptable to small and large areas. Basal diameter of grasses is commonly employed for monitoring.	Suitable to estimate cover for small shrubs, rhizomatous grasses and bunchgrasses. Cover classes enable repeatable results between surveyors.
Limitations	Canopy intercepts are sensitive to wind and surveyor differences. Not recommended for cover less than 5% or greater than 35%. Field sampling design may not be appropriate for all vegetation types in U.S.	Not suitable for dense intermingled herbaceous species. This method is only appropriate for species with a relatively large basal area (i.e. bunchgrasses, shrubs) or small gaps in the canopy.	Estimates are subject to surveyor bias and requires training to standardize observers.
Additional Comments	Requires a large number of points to meet sample size adequacy. Focus is on dominant plant species.	Suitable in sparse vegetation where the plants are distinct and shrub communities, such as the Western U.S.	Data are summarized using the midpoints for the cover class, results in low precision over time.
References	Diersing et al. 1992; Tazik et al. 1992.	Canfield 1941; Bonham 1989.	Daubenmire 1959.

Table K-2. Primary LCTA II Data Collection Methods

	Nested Cover Quadrats	**Densiometer**	**Braun-Blanquet**
Description	Initially a small quadrat (i.e. 10 x 10 cm) is designated and visual estimates are made of the percentage of the quadrat occupied or covered by a vertical projection to the ground. The area is progressively doubled to twice the area, 4 times, 8 times, etc. The smaller quadrat is nested within the larger quadrat. Cover is estimated relative to the quadrat size with each enlargement.	A concave or convex spherical densiometer is held at elbow height. A grid is etched on the surface of the spherical densiometer and the grid intersections (points) are tallied where the canopy is open. Four estimates at the cardinal directions are averaged for each sampling point.	A surveyor deliberately and carefully selects a non-random sample location. A detail description of the sample location is made, which may include information on slope, aspect, soil depth and type. A species list is made and then groups are formed from locations that have a number of species in common. Groups are usually arranged by a computer program and provide a classification from associations.
Intended Application	Canopy cover	Canopy cover (usually for forest)	Classification of plant communities
Other Potential Uses	Frequency, species composition, vegetation condition and trend		Canopy cover and abundance estimated by seven classes, species composition
Strengths	Cover estimates are relative to quadrat size.	Most effective in stands of trees greater than 10m.	Detailed description of the area.
Limitations	Cover estimates requires extensive training and repeated comparisons with measured data or between surveyors. Difficult to estimate cover in large quadrats.	Weather conditions may impact the accuracy of the cover estimates, such as bright sun reflecting in the mirror and wind moving the over story foliage.	Subjective and dependent upon the experience and knowledge of the vegetation type by the surveyor.
Additional Comments	In general, cover estimates are desirable when individuals can not be determined.	Tend to over estimate canopy cover if the under story vegetation is greater than 1m.	Quadrat size should be no larger than 10m x 10m when numerous species are present for cover estimates. May not detect a change because of decrease precision with cover classes.
References	Bonham 1989.	Lemmon 1956, Vora 1988.	Braun-Blanquet 1932; Shimwell 1971, Mueller-Dombois and Ellenberg 1974.

Table K-3. Primary LCTA II Data Collection Methods

	Modification of the Modified Step-Point	Nested Frequency	Prism Sampling
Description	The nearest species to the point in a forward direction, 180^0 arc along a transect is recorded. Occurrences for each species are summed and divided by the total number of points.	To determine frame size, a small area (i.e. 10 x 10 cm) is designated and all species presence are listed. Then the area is progressively doubled to twice the area, 4 times, 8 times, etc. and with each enlargement any new species encountered are listed. Quadrats are located side by side, with a smaller quadrat located within a large quadrat. Frequency is the percentage of quadrats in which a species is recorded.	The surveyor pivots a glass prism 360^0 over the sampling point. All tree stems that are not completely offset when viewed are tallied. The diameter at breast height (DBH) of each tree is sometimes measured.
Intended Application	Frequency	Frequency	Basal areas, volumes or numbers of trees per unit area can be computed from the tallied points.
Other Potential Uses	Species composition, vegetation condition and trend	Vegetation condition and trend, species composition	
Strengths	Quick estimate of species composition. Reduces surveyor bias from pin placement.	Simple to obtain, rapid and objective. Nested frequency is an effective technique to estimate frequency for a number of species. Reduces surveyor bias compared to other techniques.	Ability to estimate timber parameters for large area. Cost-efficient and precise estimate of volumes.
Limitations	Unable to conduct statistical analysis for change over time because of the bias. Tend to over estimate frequency if a species is recorded at every point.	Frequency is dependent on spatial distribution of the species and plant size. Desire frequency estimates between 20% - 80% within a given quadrat to best detect changes.	Sighting difficulties in dense stands; angle gauge would be more suitable. Does not provide a good estimate of stand structure, such as regeneration (trees/ac).
Additional Comments	Vegetation condition is based exclusively on vegetation present/absent and not environmental parameters such as soil stability.	Provides information on the distribution of the species.	Also referred to as probability proportional to size (PPS). Larger trees have a higher probability of being selected. Surveyor needs to be trained in selecting the appropriate prism and correcting for slope.
References	Owensby 1973.	Winward and Martinez 1983; Curtis and McIntosh 1950.	Avery and Burkhart 1995.

K.3 Relationship of LCTA II Methods and LCTA Data Elements

Table K-4 links an LCTA II method with specific LCTA data elements.

Table K-4. Matrix of LCTA II Method and Data Elements

Method	Data Provided	LCTA Data Element(s) Satisfied
Nested frequency	frequency, species composition, vegetation condition and trend	vegetation condition, composition, cover
Point-intercept (LCTA)	ground and canopy cover, frequency, species composition, vegetation condition and trend	c-value data: vegetation cover (%), ground cover, minimum drip height; disturbance in relation to cover; vegetation condition, composition, cover
Line-intercept	ground and canopy cover, frequency, species composition, vegetation condition and trend	c-value data: vegetation cover (%); vegetatioen condition, composition, cover
Daubenmire	canopy cover, frequency, species composition, vegetation condition and trend	c-value data: vegetation cover (%); vegetation condition, composition, cover
Nested cover quadrats	canopy cover, frequency, species composition, vegetation condition and trend	c-value data: vegetation cover (%); vegetation condition, composition, cover
Braun-Blanquet	plant community classification, canopy cover	vegetation map, composition, cover
Belt transect (density quadrat)	density, frequency, species diversity, population dynamics including TES	vegetation composition, density
Tagged rare plant studies	rare plant demographics	threatened, endangered and sensitive species surveys
Modification of the modified step-point	frequency, species composition, vegetation condition and trend	vegetation condition, composition, cover
Forage clipping	above ground forage (biomass)	forage quantity
Grazing photographic points	utilization	forage quantity
Visual obstruction method (density board)	tactical concealment	visibility/line of sight
Concave/convex densiometer	Over story canopy cover	forest measurements
Prism sampling	basal area, volume, number of trees per unit	forest measurements

Method	Data Provided	LCTA Data Element(s) Satisfied
Diameter tape, Biltmore stick	DBH of trees	forest measurements
Hypsometers (i.e. clinometer, relascope, Abney level)	tree height	forest measurements
Tree condition	crown loss, wounds and objects on trees	forest measurements
Forest Health (USDA)	forest ecosystem condition and trend; presence and abundance of macro-lichen on woody plants, tree damage, tree mortality, vegetation structure, plant diversity, tree crown condition, foliage transparency, crown density, tree growth, tree regeneration	forest inventory/health measurements, forest measurements
Clinometer	slope, aspect, topography	slope and aspect
Site rehabilitation prioritization (SRP)	suitability for training activities, ranks training sites for LRAM projects	land-use disturbance: intensity and distribution; active erosion areas: status and locations
Soil penetrometer	soil compaction, bulk density	soil condition
Sediment basin measurements	sedimentation	soil condition
Wind erosion measures	wind speed moving particles	wind erosion data
Water sampling	surface water quality	water quality
USEPA Rapid Bio-Protocol (benthics)	biomass or number of individuals in benthos and drift collections	baseline resource surveys, monitoring resource surveys
Air quality samplers	air quality	air quality
Electronic weather stations (SAMS)	precipitation amounts, wind speed, wind direction	climatic data: historic and current
Floristic inventory	species list, vouchers, vegetation map	baseline survey, vegetation map
Vegetation mapping	plant community map, TES map (resolution varies by element)	vegetation map
Wildlife surveys	bird counts, small mammals, herps, etc.	baseline resource surveys, monitoring resource surveys

K.4 Plot Monitoring and Data Collection

LCTA data are collected from the field using LCTA II methods and are also available from other sources. Data requirements may vary by Major Army Command (MACOM), Waterways Experiment Station (WES) ecoregion, and installation.

Data collection may change over time depending on the natural variability of the systems, land-use impacts, program resources, and the ability of chosen survey design and sampling techniques to detect trends in resource conditions.

K.4.1 Sampling Intervals

The general factors that affect the sampling intervals at ITAM installations include climactic difference; stable versus unstable nature of vegetation; and land use patterns, frequencies, and intensities.

- **Climatic Differences**. Climatic differences from year to year have profound effects on vegetation in arid and semi-arid regions. Periodic droughts in temperate regions also influence trends in vegetation conditions. For example, an area that showed trends of decreased perennial ground cover might be acutely affected by a drought.

  The varying climatic conditions make baseline determination and trend analysis challenging and thus influence decisions regarding sampling frequency. For this reason, some installations may decide to use data collected during the first three to five years as their baseline from which to identify trends.

- **Stable versus Unstable Nature of Vegetation**. In temperate and forested areas, vegetation is generally more consistent from year to year, barring significant disturbances from land use, natural factors (e.g., fire, insects, etc.), or management practices. Conversely, in semi-arid conditions vegetation is often times less consistent from year to year. Factors creating less stable vegetation conditions include wild fires, length of time for perennial versus annual species to become established in an area, and the recovery rate of the land in relation to the severity of training exercises.

- **Land Use Patterns**. Land use patterns, frequencies, size of the installation, and intensity of training events are other factors affecting sampling intervals at an installation. For example, on a broad scale, military land-use patterns on TRADOC installations are generally more repetitive and concentrated than those found on FORSCOM installations. Many TRADOC installations, therefore, would be expected to have a lower proportion of land that is disturbed on an annual basis. This situation could in turn lead to a less intense or less frequent sampling effort.

Installation size also appears to influence sampling frequency; some installations sample a subset of LCTA plots annually to avoid data collection costs every year.

In addition to vegetation, ground cover, disturbance, and wildlife, other resources are sampled to satisfy particular installation objectives. The resources sampled in LCTA programs include measurements for erosion estimation on cryptogamic sites, soil compaction, weather, air quality, concealment estimation (e.g., modified density board, Visual Obstruction Method), stream sediment, forest canopy closure, tree basal area, aquatic health, and surface water quality.

K.4.2 Allocating Plots

One strata, such as a vegetation map, may adequately provide the delineation necessary to allocate the plots. However, soils can be important to incorporate site potential, while training areas successfully incorporate a military land management unit. The inclusion of administrative units such as training areas allow for extrapolation of data in a way that is useful to trainers, but generally increases the desired sample size significantly. Table K-5 lists the attribute layers by percent usage in plot allocation.

Table K-5. Attribute layers used in stratified random survey design.

Plot Allocation Strata			
vegetation	**land cover**	**soils**	**land use**
	x	x	
x		x	x
x			x
x	x	x	x
x	x		x
		x	x
			x
	x		

This traditional method of plot allocation does not account for the variability within the different vegetation/soils types. As a result, some allocation categories are under sampled. The original LCTA plot allocation algorithms have been modified within the last several years to ameliorate this problem, but these modifications have not been applied extensively.

K.4.3 Sampling Size and Position

The original LCTA sample survey design was not intended to detect statistically significant changes in resource conditions. However, more recently, land managers and LCTA staff on installations have expressed a desire to make statistical inferences

using LCTA data. LCTA monitoring objectives and their relationship to land management goals, which vary by installation, ultimately determine the sufficiency of the LCTA monitoring approach. To detect statistical changes in resources with a specified level of confidence, a re-evaluation of sample survey design, including sample size, is advisable.

If data variability within a type is high, then detecting change in the resource can be difficult. On most installations, more plots may be necessary to minimize the variability and show statistically significant changes or, alternatively, confirm that conditions are relatively static. Different equations exists for sample size determination based on temporary or permanent plots and density/cover estimates or frequency.

Sample size adequacy for a particular response (i.e., aerial cover) can be determined using the steps and associated equations as presented by Platts et al. (1986) for estimating a single population mean or a single population total with a confidence interval around the mean or total for stratified random sampling designs. The classic approach to estimating sample size as described by Cochran (1977) is appropriate for simple random sampling designs. LCTA data is often treated as simple random sample data.

NOTE: Include citations for referenced documents, or delete citations.

K.4.4 Monitoring

Characterizing natural resources on Army lands can be accomplished in various ways, depending on the level of detail desired, available resources, the ecological setting, and degree and patterns of land use. For any particular installation, a number of sample survey techniques and data collection methodologies can be used to meet the LCTA data requirements identifies by installation personnel. In addition, natural resource managers, environmental staff, and trainers may have additional data needs. Some data elements may already be collected under existing or future installation conservation programs.

To determine the data to collect specify the objective of the sample survey by identifying the specific questions or issues related to resource conditions, land management, and military training and testing that the LCTA protocols will attempt to address. Data elements commonly collected include those identified in Appendix J.

Once the objectives are clear, the data to collect, the method for collection, and the approach for summarizing, analyzing, and presenting LCTA finding to decision makers can be determined.

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APPENDIX L: ATTACC METHODOLOGY

NOTE: AEC will reference ATTACC handbook and intro in section 5 during this staffing cycle.

L.1 ATTACC Overview

The Army Training and Testing Area Carrying Capacity (ATTACC) is a methodology and integrated decision support system for estimating the operations and support (O&S) costs of using land at Army installations for training and testing purposes. ATTACC methodology includes specific processes and algorithms to predict land rehabilitation and maintenance (LRAM) requirements based on training and testing load and environmental conditions.

The two major objectives of ATTACC are to:

- Identify training and testing land carrying capacity
- Establish a model to predict LRAM requirements based on training and testing usage.

ATTACC is the standard ITAM methodology for estimating training land carrying capacity by relating training load, land condition, and land maintenance practices. When the cost of these land maintenance practices are considered, ATTACC also provides a means for estimating future Land Rehabilitation and Maintenance (LRAM) costs based on future training requirements.

L.2 ATTACC Components

Figure L-1 illustrates the three components that comprise the ATTACC methodology.

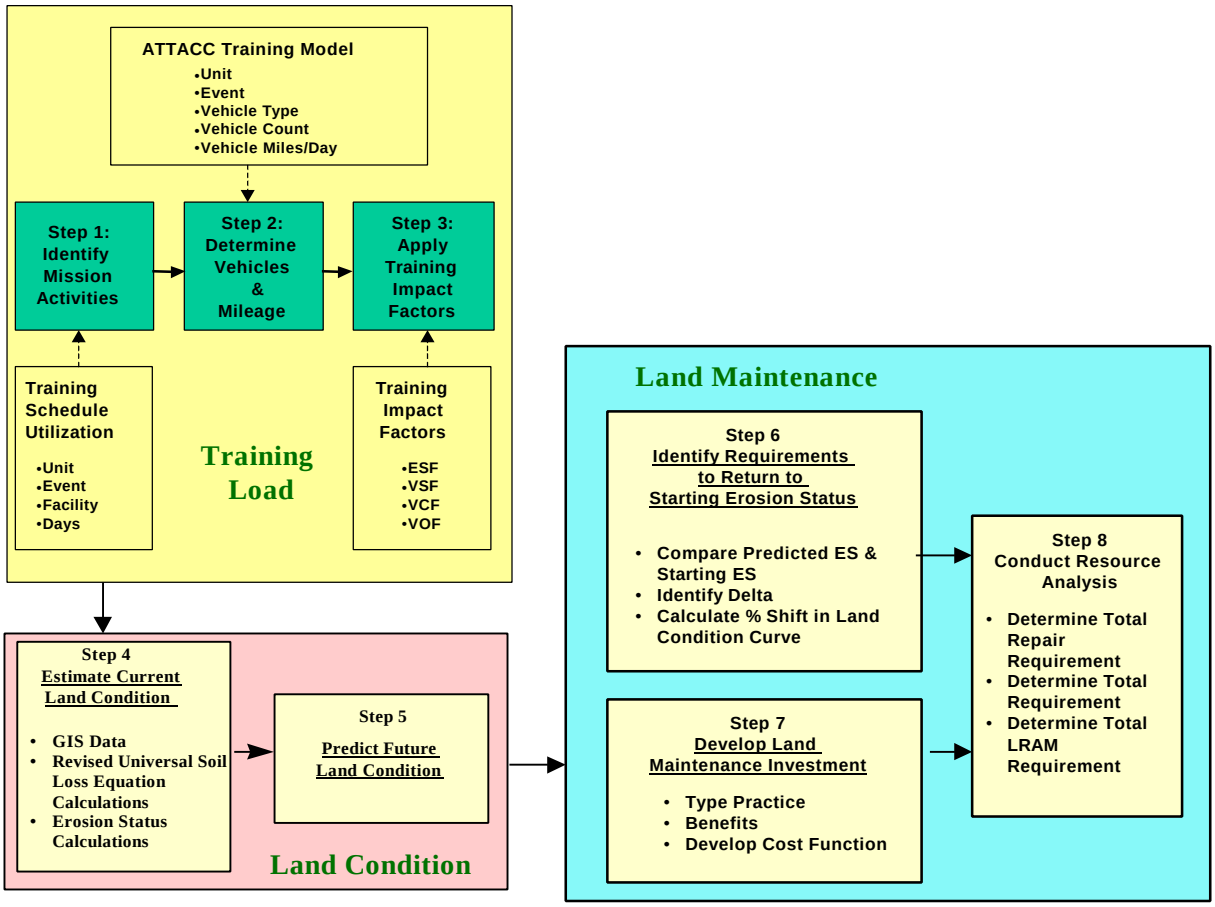


Figure L-1. ATTACC Components.

Training Load. Training Load is the collective impact of all military activities that occur on a given parcel of land. ATTACC measures *training load* in terms of *Maneuver Impact Miles (*MIM). One MIM is the equivalent impact of an M1A2 tank traveling one mile while participating in an armor battalion field training exercise. MIM values for a given mission activity remain constant across the Army, regardless of location.

- **Land Condition**. Land Condition is the state of the land. ATTACC measures **land condition** in terms of the *Erosion Status*. Erosion Status is the ratio of predicted erosion rates to tolerable erosion rates, with values greater than one indicating poorer land condition, and values less than one indicating better land condition. Erosion rates are estimated using the Revised Universal Soil Loss Equation (RUSLE), a scientifically accepted method utilizing percent vegetative cover, climate, soil type, length/slope (a derivative of topography), and a conservation practice factor.

Land Maintenance. Land Maintenance is the collection of LRAM practices and their associated costs. ATTACC measures *land maintenance* in terms of the type of practice, costs, and associated effectiveness measures. Cost factors are calculated and expressed in dollars per mile ($/Mile) for each vehicle type.

L.3 Determining the Relationship between Training Load and Land Condition

The ATTACC relationship between training load and land condition for a given parcel of land can be represented as a land condition curve, as pictured in figure L-2. As training load increases, land condition deteriorates. Land condition is expressed qualitatively on a Red-Amber-Green scale, with red indicating poor land condition and green indicating good land condition.

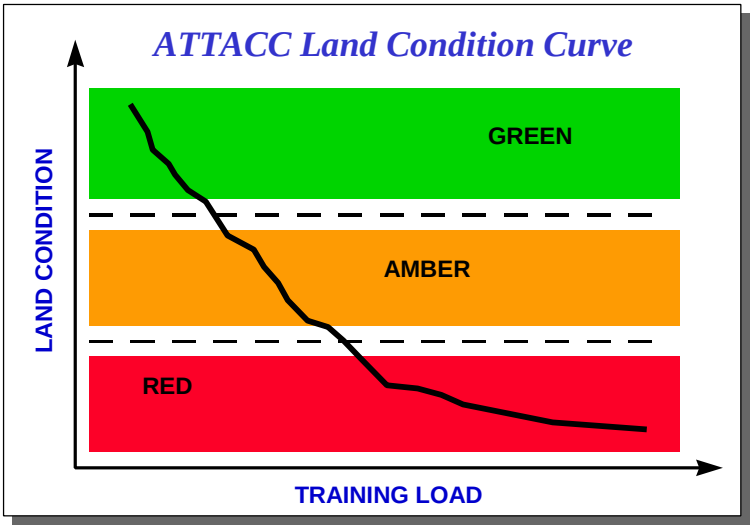


Figure L-2. Land Condition Curve.

L.4 Determining Training Land Carrying Capacity

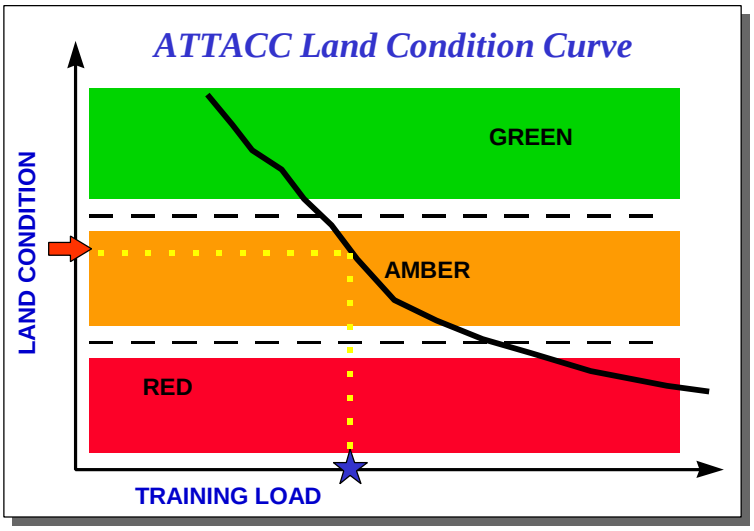


Figure L-3. Determining Training Land Carrying Capacity

The land condition curve can be used to determine the training land carrying capacity, by corresponding the training load with a target land condition. The star on

figure L-3 illustrates the training land carrying capacity that corresponds with the target land condition, depicted by the arrow.

L.5 Determining LRAM Requirements

As land maintenance practices are applied, the land condition curve shifts, reflecting improved land condition and increased training land carrying capacity, as shown in figure L-4.

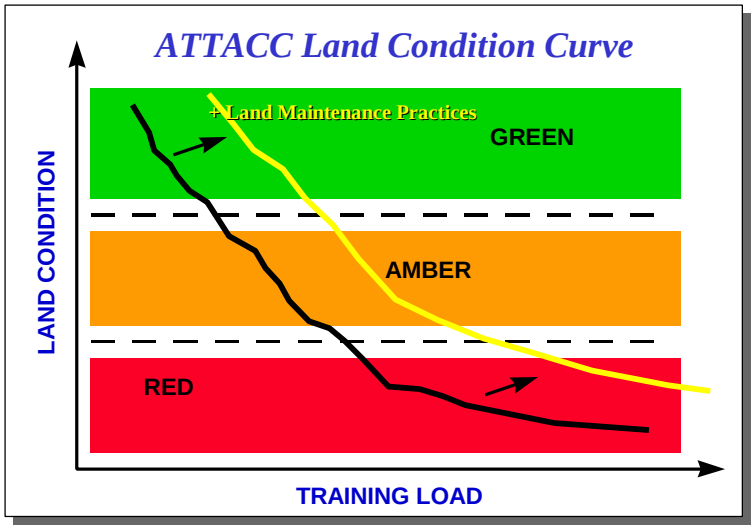


Figure L-4. Determining LRAM Requirements

L.6 Supporting Land Management Decisions

ATTACC principles have application throughout the installation, MACOM, and HQDA training land management process. ATTACC will provide decision support to the installation training land manager in his/her objective of optimizing training land usage while minimizing repair and maintenance requirements. By considering the costs of land maintenance practices, ATTACC also provides a means for estimating future LRAM costs of future training requirements.

APPENDIX M: FUNCTIONAL DESCRIPTION OF A GIS

A geographic information system (GIS) is a computer-based tool for mapping and analyzing things that exist and events that happen on earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps. These abilities distinguish GIS from other information systems and make it valuable to a wide range of public and private enterprises for explaining events, predicting outcomes, and planning strategies.

M.1 Definition

A GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information, i.e., data identified according to their locations. The system can be used to analyze and model (manipulate, overlay, measure, compute, and retrieve) the digital spatial data and display the new map products and tabular resource information showing the results of the spatial analysis.

A GIS can map any information stored in spreadsheets or databases that have a geographic component to allow the user to see patterns, relationships, and trends that can't be seen in a table or list format. A GIS stores information about the world as a collection of thematic layers that can be linked together by geography.

M.2 GIS Components

A working GIS integrates these five key components: people, hardware, software, data, and methods.

M.2.1 People

GIS technology is of limited value without the people who manage the system and develop plans for applying it to real-world problems. GIS users range from technical specialists who design and maintain the system to those who use it to help them perform their everyday work. Typically, people within an organization fall into one of three levels of functionality and capability requirements from a geographic information system - viewers, users, and doers. It is from these three categories that it is possible to identify the requirements necessary to build a functional GIS network and operating system.

- **Viewers** - are those people that need to view the GIS and ask simple questions of that information.

- **Users** - are those individuals that need to ask more complex questions of the GIS. This may involve asking very specific spatial and network analysis questions. Some people may need to make basic changes to the GIS data.

- **Doers** - are those individuals that have an intimate knowledge of the GIS and actually develop, maintain, and make the GIS data available across the enterprise.

M.2.2 Hardware

Hardware is the computer on which a GIS operates. Today, GIS runs on a wide range of hardware types, from centralized computer servers to desktop computers used in stand-alone or networked configurations. Additional hardware commonly associated with a GIS is a digitizer, plotter, and scanner. A digitizer is a table and a cursor with crosshairs and keys that encode locations of geographic features and convert them into x,y coordinates stored in computer files. A plotter is a large-format printer and a scanner is a device that can read text or illustrations printed on paper and translate the information into a form that the computer can use.

Table M-1. Current Hardware Requirements by User Type.

Type of User	Processor	Speed (MHz)	RAM (MB)	Hard Disk (GB)	Monitor	Video Card	CD-ROM	Video RAM (MB)
Viewer	Pentium	200	64	2.1	17" Color SVGA	1024 x 768	8x	2
User	Pentium II	300	128	4	17" Color SVGA	1024 x 768	16x	4
Doer	Pentium II	400	256	6.4	21" Color SVGA	1024 x 768	24x	8

M.2.3 Software

Software provides the functions and tools needed to store, analyze, and display geographic information. Key software components are:

- a database management system (DBMS)

- tools for the input and manipulation of geographic information

- tools that support geographic query, analysis, and visualization

- a graphical user interface (GUI) for easy access to tools.

There are several GIS software packages on the market today. The most popular are Environmental Systems Research Institute's (ESRI) Arc/Info and ArcView; Intergraph's Modular GIS Environment (MGE) and GeoMedia; and the Corps of Engineer's Geographic Resource Analysis Support System (GRASS). More detailed explanations regarding the products are provided under the "GIS Software Description" Section.

M.2.4 Data

Possibly the most important component of a GIS is the data. Geographic data and related tabular data can be collected in-house or purchased from a commercial data provider. A GIS will integrate spatial data with other data resources. Some common practices of collecting spatial data are digitizing (on-screen and with the use of a digitizing tablet), scanning, and using of a Global Positioning System (GPS).

- **Digitizing***:* Digitizing is the process of converting features on a paper map into digital format. When you digitize a map, you use a digitizing tablet connected to your computer to trace over features in which you are interested. The X,Y coordinates of these features are automatically recorded and stored as spatial data.

  On-Screen digitizing is using geographic data as a backdrop on the monitor screen and creating a point, line, or polygon by "tracing" over the object. Aerial photography is commonly used as the backdrop for items such as roads, buildings, and utilities.

- **Scanning***:* To translate an image into digital format with the use of a scanner. The scanner translates the image into bitmaps and stores them in a file readable by a computer.

- **GPS***:* GPS stands for Global Positioning System. GPS is a system of geostationary satellites, ground receivers, and associated software that provides an electronically instrumented means of determining positions on the earth.

- **Imagery***:* Satellite imagery and aerial photography provide a tremendous data source for on-screen digitizing of additional data. It also provides a source for vegetation analysis, soil and erosion studies, land management and disturbance detection, as well as a photographic backdrop for mapping purposes. For more information regarding imagery, please refer to the "Remote Sensing User's Guide" produced by the U.S. Army Environmental Center (USAEC) and the Topographic Engineering Center (TEC).

M.2.5 Methods

A successful GIS operates according to a well-designed plan, executive orders, and business rules, which are the models and operating practices unique to each organization.

- **TSSDS***:* The Federal Geographic Data Committee (FGDC) (**at** www.fgdc.gov**)** under an Executive Order **(CITE THE E.O. Number)** has endorsed a geo-spatial data standard known as the Tri-Services Spatial Data Standard (TSSDS). This standard defines a series of spatial features as well as the graphical representation of those features supported in a variety of formats. The Tri-Services Spatial Data Standard was established to promote the development, use, sharing, and dissemination of geo-spatial data on a national basis. The Tri-Services Spatial Data Standards (TSSDS) are produced on CD-ROM as well as on their Internet site at tsc.wes.army.mil.

  The TSSDS Data Model Organization defines spatial data layers into classes and sets in the following manner:

  - Entity Sets: Broad grouping for data management purposes.
  - Entity Classes: Grouping of data within each Entity Set for Data Management Purposes.
  - Entity Types: Grouping of Items that appear graphically on a map or drawing. Grouped within each Entity Class.
  - Entities: Items that appear graphically on a map or drawing. Grouped within each Entity Type. Each Entity Type may have one or more Entities.
  - Attribute Tables: A relational database table containing non-graphic information, or attribute data. Grouped within each Entity Class.
  - Domain Tables: Contains lists of “valid” or “permissible” values for specific attributes in an Attribute Table.

- **Metadata***:* On April 11, 1994, President Clinton signed the Executive Order 12906, “Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure”, which made metadata a requirement that all Federal agencies use these standards to document newly created geo-spatial data.

  Metadata is “data about data.” Metadata is descriptive information regarding digital geo-spatial data files. It can assist an organization providing key information for the use and management of its GIS data

sets. Metadata helps people locate the data they need, know what the history of the data is, and how best to use it. Metadata is entered in manually by the author of the data layer at its creation. It contains information such as the data set, its map units, the projection, the resolution of the feature, suggested display scales, authorship, source information, origin, and descriptions regarding attribute information and associated tables. It only takes a few minutes to create and can save hours in the long run. It should be viewed as a component of the GIS data set that provides information supporting the use and application of the data internally within an organization but also in support of transferring spatial data to others.

- **Data Sharing and Distribution***:* Sharing of spatial and tabular data is encouraged. The best scenario is to store data in a centralized location provides a variety of benefits to organizations of all sizes. With data in one location, duplication of data layers is reduced saving data storage space. Additional benefits include lessening the confusion of locating the "best" data layer, ease of tape back-ups, reduction of storage space and cost, and superior data maintenance and management. If centralized data storage is not available, sharing data with other organizations is still encouraged over the network or via other media. When sharing data, remember to include all metadata with the data.

- **Maintenance and Data Updates***:* Typically data is dynamic in nature and must be maintained at regular intervals. Each installation should determine the frequency with which changes and additions are made to the data set after the initial data set is complete. The frequency can include periods such as daily, weekly, monthly, annually, as needed, or continually.

- **Privileges and Permissions***:* Network software allows the administrator to set privilege levels on user accounts, which determine the actions that the user can perform on the network. On a Windows NT Network, there are three privilege level settings (User, Administrator, or Guest) assigned to each user account. There are also the following types of access a user can be given: no access, read, list, add, add and read, change, full control, special directory access or special file access.

M.3 How a GPS Works

Here are five logical steps on how GPS works:

1) The basis of GPS is "triangulation" from satellites;

2) To "triangulate", a GPS receiver measures distance using the travel time of radio signals;

3) To measure travel time, GPS needs very accurate timing which it achieves with some tricks;

4) Along with distance, the user needs to know exactly where the satellites are in space;

5) Finally, the user must correct for any delays the signal experiences as it travels through the atmosphere.

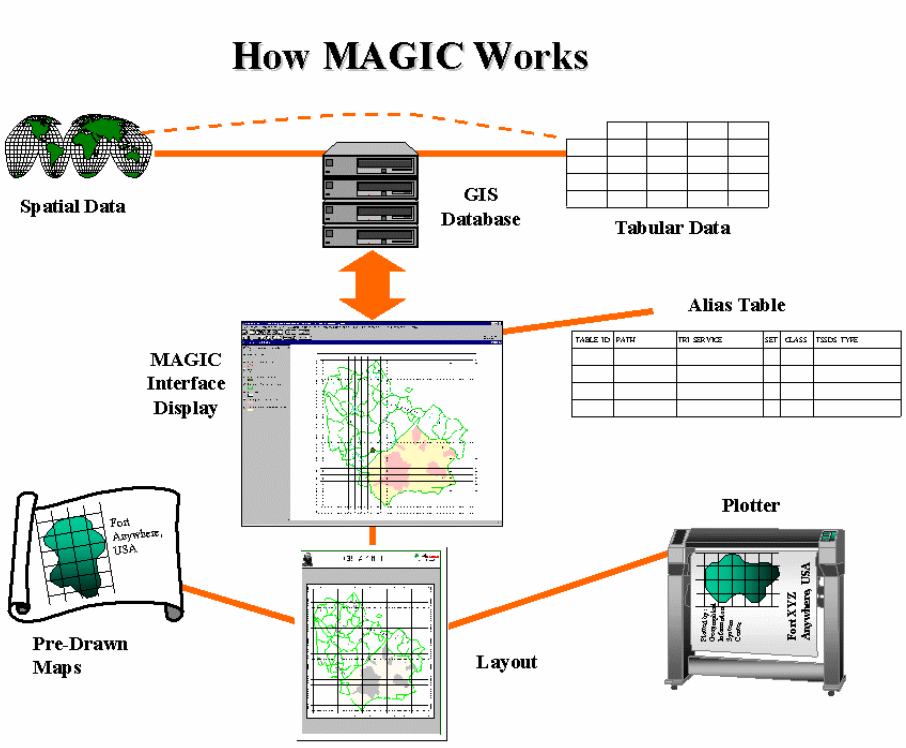
APPENDIX N: MILITARY ACTIVITY GIS INTERFACE CONCEPT (MAGIC)

MAGIC was developed by CTSD and AEC specifically for the ITAM Program to provide a standardized GIS user capability. MAGIC is a user-friendly modular GIS system tailored for various ITAM user groups. **It provides the user with a flexible and easy way to access GIS data and produce GIS products by using drop-down, menu driven, point-and-click capabilities.**

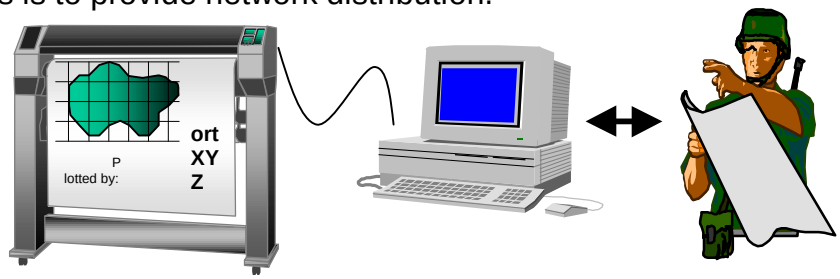
MAGIC Version 1.0 was developed using ArcView's object oriented programming language, Avenue. MAGIC runs with ArcView in the background and makes use of ArcView extensions, customizations, scripts, and other applications. MAGIC uses an "alias table" to access both spatial and tabular data from a centralized database. This approach provides for site specific tailoring of MAGIC.

MAGIC is provided on magnetic media along with documentation necessary to install and tailor site unique data locations and information regarding support available from ITAM GIS Regional Support Centers. Using MAGIC, the user has a live link to the database, by which the user can print installation-developed maps and "what you see is what you get" (wysiwyg) displays to a system plotter.

N.1 How MAGIC Works



A Manual is provided as a reference to give users step by step instructions on how to install, customize, and maintain MAGIC, as well as create and print maps. MAGIC is designed to operate in a windows environment using drop-down menu driven commands. A practical approach for allowing people to utilize MAGIC to its fullest abilities is to provide network distribution.

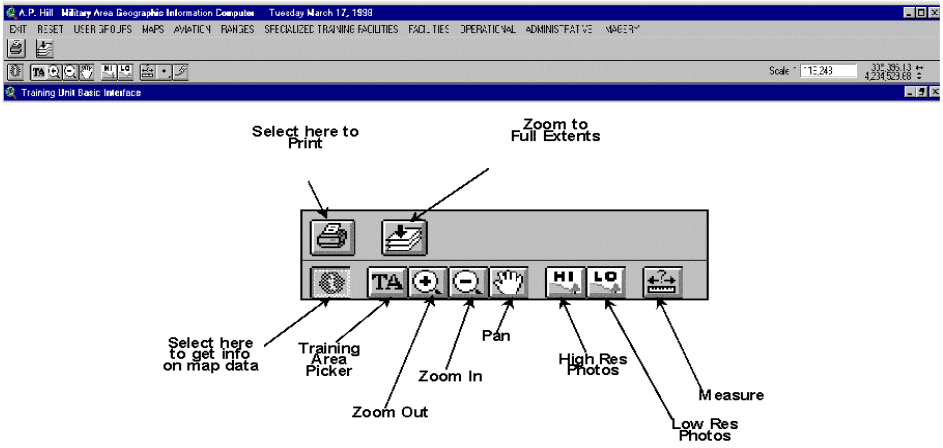


MAGIC Version 1.0 contains four user group interfaces designed to meet specific installation needs. The current user groups are as follows:

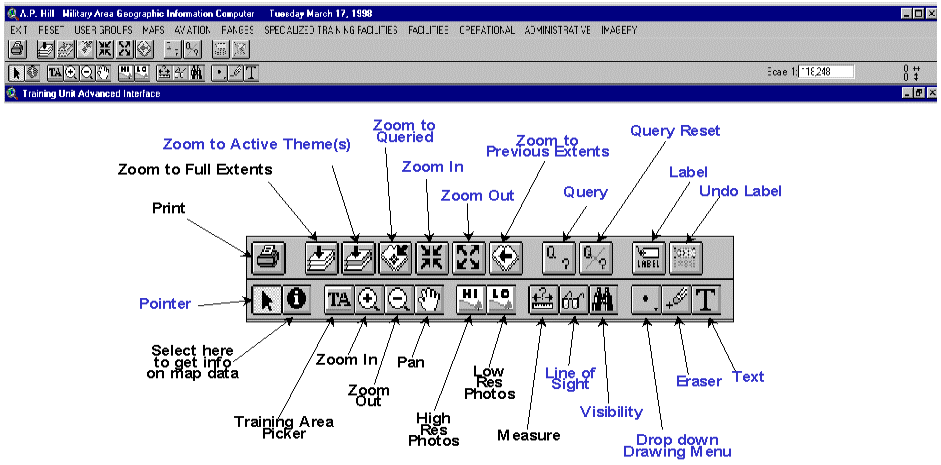
- Training Unit Basic
- Training Unit Advanced
- ITAM Coordinator
- Command Interface.

Each interface reflects data that each user group would utilize and in a user-friendly, intuitive, menu style format. Both the Basic and the Advanced Training Unit Interfaces allow training units to produce custom maps products. All user interfaces can be password protected to safeguard sensitive information.

- **TRAINING UNIT BASIC INTERFACE:** Soldiers using the system for the first time get an intuitive interface with access to training data.



- **TRAINING UNIT ADVANCED INTERFACE:** Soldiers experienced with the system, or with computer backgrounds, have access to the same data but with increased functionality.



- **ITAM COORDINATOR INTERFACE:** ITAM coordinators have access to data and tools required for and tailored to their specific mission. ITAM program personnel have both graphical and database information access for all elements of the facility. As with all other interfaces of MAGIC, a spectrum of information can be viewed, over layed, and plotted in color to support analysis and

presentations. **Geographic data can be plotted in color from A ($8^1/_2$"x11") to E (34"x44") size, and database information can be printed in report formats defined by the user.**

Other functions available to the ITAM Coordinator are as follows:

- LRAM project location design, photography, and reports can be displayed using MAGIC
- LCTA monitoring sites and special use plots are displayed and associated tabular data is accessed by point and click.

Other functions accessible by all user groups are:

Simple query capabilities

- Redline capabilities
- Line of Sight capability
- Visibility.

N.2 Future Additions to MAGIC

Additional functionality currently being implemented into MAGIC Version 2.0 include integration with RTLP-AIS (both RFMSS 3.5 and RFMSS XXI), NED, and ATTACC. Other additions must be submitted and approved by the ITAM Configuration Control Board.

To obtain a copy of MAGIC and the accompanying MAGIC User Guide, contact your MACOM.

APPENDIX O: ITAM USER REQUIREMENTS

NOTE: Added Feb 99, will review & may become an earlier appendix

I. Background

In order to determine user requirements for the ITAM program, The Department of the Army Deputy Chief of Staff for Operations (DCSOPS) conducted two workshops in July and October 1994. Nineteen integrated installation teams, each consisting of a "Trainer" and an "Environmentalist", participated by providing approximately 150 front-line-user requirements for ITAM. Representatives from the Army Training Support Center (ATSC), the Army Environmental Center (AEC), the Construction Engineering Research Laboratories (USACERL), and Office of the Assistant Chief of Staff for Installation Management, Environmental Programs Directorate (ODEP) also provided valuable input.

After the installation teams worked together to combine and reduce the original 150 requirements to 43, each requirement was discussed in detail in terms of: 1) existing methods, 2) deficiencies in the methods, 3) needed corrections and additions, and 4) consideration of what happens if the requirement was not fulfilled. As a result of these discussions, the workshop participants then arranged these 43 requirements into 11 major topics. These topics or user requirements groupings form the basis of this document which was prepared by the Army Training Support Center, Combat Training Support Directorate (ATSC-CTS) with the assistance of ODEP and AEC.

In order to ensure that the ITAM program continues to address the needs of its users, installations will be asked to submit their requirements to the MACOMs on an annual basis. The MACOMs will consolidate, coordinate and provide prioritized requirements for consideration at the DA level. ATSC-CTS and the ITAM program management staff will then review, refine, and update user and program requirements. The overall goal is for ITAM to become a standardized Army program designed so that it can be easily modified, expanded, or reduced to fit the special requirements of both large and small installations.

II. ITAM Requirements Groupings

As a result of the user requirements generation process, 43 user requirements which resulted from two ITAM users workshops were divided into 11 major topics. These topics and their constituent user requirements are listed below. Note that some requirements are relevant to more than one major topic.

1. Provide Resources

Provide Dollars to Adequately Implement and Sustain Program (2.1)[12]. Identify Management Procedures at Installation, MACOM and DA Levels (2.8). Provide R&D and Acquisition Funds to Support Technology and Tools (2.36).

2. Provide Staff

Identify and Provide Staffing Requirements (2.2).

3. Educate

Provide a Comprehensive Environmental Awareness Program (2.9).

Educate Environmental Staff on Training Needs (2.12). Identify Specific State and Federal Environmental Laws and Regulations that Affect the Installation (2.23, 2.31)).

4. Inventory the Natural and Cultural Environment

Inventory the Natural and Cultural Environment (2.6). Periodically Monitor Condition of Natural and Cultural Resources (2.17). Support Threatened and Endangered Species (TES) Compliance (2.20). Provide Installation-Specific Natural Resources Information (2.24). Gather, Compile and Report Required Archeological Information (2.29). Provide Installation/Eco-region Specific Restructuring of LCTA (2.37). Provide Ability to Assess Wind, not just Water, Erosion (2.38).

5. Inventory Training Requirements and Assets

Catalog a Training Event/Space Baseline of Assigned Training Missions and Land Requirements (2.14). Detail Training Requirements by Event or Task (2.15).

6. Provide Geographical Information System Capability

Integrate User-Friendly GIS into Land Management Activities (2.26). Consider use of Global Positioning System (GPS) for Training Exercises to Safeguard Resources (2.40).

7. Integrate Training and Environmental Requirements

Provide for Integrating Training Requirements with Environmental Conditions (2.11). Locate Types of Training where they can be Best Supported (2.13). Utilize Every Acre According to its Capabilities (2.18). Adjust Land Uses to Stabilize & Sustain Resource

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[12] Numbers in parentheses refer to list of 43 requirements from Working Group I.

Conditions (2.19). Provide an Asset which will Support Training under Realistic Conditions (2.21). Know what New Systems are Going to be Fielded and How They Will Affect Training (2.27). Provide a Way to Combine all Environmental Information with Training Information (2.28). Provide Contracting Procedures to Improve Efficiencies (2.30).

8. Predict Carrying Capacity and Usage Impacts

Identify Carrying Capacity of Land (2.4). Consider Use Of GPS for Training Exercises to Safeguard Resources (2.40). Predict Impact on Land Based on Usage (2.5). Training Flexibility Versus Environmental and Land Damage (2.32).

9. Maintain and Repair Land

Maintenance, Repair, or Rehabilitation of Land (2.7). Range Ordnance Decontamination (Sub-Surface) Methods and Procedures (2.42). Develop Vehicle Dust Abatement Technology (2.43).

10. Provide Decision Support

Incorporate Natural Resources Data into Training Decision Systems (2.3). Provide Decision Support Information (2.10). Integrate Total Process (2.22). Include Environmental Impact Assessment in Training Documents (2.25). A Way to Combine all Environmental Information with Training Information (2.28). Provide Information on Training Activities of Concern to Natural Resources Management Personnel (2.33). Establish a Means to Provide Information for Project Development and Preliminary Environmental Assessment for Siteing Projects (Military Construction, Army) (2.35). Provide Information for Export to System for Determining Land Requirements (2.41).

11. Provide Reports

Develop Long Range Coordinated Calendar for Training and Recovery. (2.16) Gather, Compile and Report Required Archeological Information (2.29). Provide Maneuver Training Land Utilization Reports (2.34).

III. DETAILED USER REQUIREMENTS

1. Provide Resources

1.0. The Integrated Training Area Management (ITAM) Program will provide balancing of training and environmental requirements as a part of the decision making process for installation management. Military training loads, environmental constraints and budget cuts have put increasing emphasis on the importance of sound training land

management practices. Better management tools are needed to help land managers make increasingly difficult choices in sustaining and maintaining range and maneuver/training lands. The Army must ensure access to adequate lands for training soldiers in order to maintain combat readiness. Providing the resources needed for ITAM will be a sound business investment for effective and efficient management.

1.1 Provide dollars to adequately implement and sustain the program. (The user group members felt that this was the highest priority item because installations do not currently have enough funding to properly implement and manage the program.)

1.1.1. Initial funding for strategy development and analysis should be centralized at HQDA, DCSOPS. Implementation funding should be programmed by range and training land managers at the MACOM level based on prioritized requirements submitted by the installations.

1.1.2. Funding is required to implement transition of ITAM to trainers.

1.1.3. ITAM funding should be allocated in some other manner than the Class I to IV categorization system of the existing 1383 process. Conservation-oriented natural and cultural resource management and maintenance projects such as those in ITAM are not able to compete with compliance-oriented Class I "must fund" projects. In addition, training land maintenance funding has not been able to compete with cantonment projects in the engineer arena for RPMA funding.

1.1.4. Provide ITAM funding as part of the Command Operating Budget (COB) and improve COB guidance as it relates to ITAM.

1.2 Provide R&D and acquisition funds to support development of technology and tools for ITAM.

1.2.1. Installations need a standardized method for presenting and prioritizing needs to the R&D community that are best answered by new technologies. Too often, these needs are prioritized by external pressures or by the research community itself.

1.2.3. Establish programmatic agreements with educational institutions to conduct research using multi-disciplinary research teams. Establish regional research centers.

1.3. Identify ITAM management procedures at installation, MACOM and DA levels, while continuing to recognize that ITAM is an installation program.

1.3.1. Provide a mechanism to track and report ITAM funding streams at MACOM and installation level to ensure that funds are applied as intended.

1.3.2. Provide assistance with environmental contracts; installation Directorate of Contracting often unfamiliar with environmental requirements. Submissions often do not arrive in timely fashion.

1.3.3. Build funding requirements into training POM. Funding oversight will be provided by the trainers office at the MACOM level with guidance from environmental office.

1.3.4. Establish a notional correlation between OPTEMPO executed at installations and the level of funding for land management functions, principally repair and maintenance.

1.3.5. Provide a management plan for purchasing computer hardware and software. Outline requirements based on estimated data loads for natural and cultural resources inventory, training inventory, spatial data, and other DBMS applications. Networking requirements, system speeds, and backup capabilities should also be considered when developing specifications for PCs, file servers, GIS workstations, printers, plotters, etc.

1.3.6. The key to successful ITAM operations is a team from the trainers and environmental offices that fully understand the field operations/training needs and the environmental compliance issues. Due to more complex laws and requirements, an important goal is to increase the coordination between the personnel responsible for setting the scheduling and use of installation training land and the personnel with expertise in soils, vegetation and environmental compliance.

2. Provide Staff

2.0 Training is the Army's most important peacetime mission, with our training land as the classroom. Integrated Training Area Management is a long range planning tool that supports sustainment of training land and also supports the Army Environmental Vision:

The Army will be a national leader in environmental and natural resources stewardship for present and future generations as an integral part of our mission.

The protection of endangered species, wetlands management, noise abatement, pollution prevention/cleanup, protection of cultural resources, and mandated public use are all factors in the training land management equations. To propose a major installation management program for these significant missions without recognizing the need for the installation command to allocate staff for the program will greatly increase the chance for failure.

Staffing requirements outlined below are based on the installation user group meetings. The requirements are not all consistent as the users did not reach universal agreement on any point.

2.1. Provide staff for the ITAM program. Because ITAM is a management program, not an automated system, personnel will be needed to perform the work.

2.1.1. Provide a standardized description of ITAM, identify the requirements for the program, and establish a plan for its Army-wide implementation. Establish workload staffing standards for ITAM for the Table of Distribution Allowances (TDA).

2.1.2. Allow each installation to determine staffing as appropriate. Installations cannot adequately manage the ITAM program without enough people. Contract labor does not provide continuity for planning, and some functions are government unique in nature (due to requirements, traditional practice and efficient management) and cannot be contracted.

2.1.3. Temporary staff allows for flexibility but does not allow for continuity. Because of inadequate permanent staffing levels at the installation level, temporary workers must be used which does not allow for continuity for planning purposes.

2.1.4. Installation staffing requirements include resources for continuing education and training of civilian land management staff.

2.1.5. The need for staff dedicated to ITAM is also true at the MACOM and DA level.

2.1.6. Installations may restructure their organization to fulfill the mission with existing permanent personnel or with the existing level of resources when current staff levels and configurations do not adequately support installation training and environmental requirements.

2.2. Consider location of ITAM management within standard installation staff.

2.2.1. Recommendation is that the ITAM coordinator shall be assigned to the DPTM, with the mission of coordinating all land use requirements. For AMC, the ITAM coordinator shall remain in the Natural and Cultural Resources (NCR) Office.

2.2.2. Resist establishment of an environmental staff inside the DPTM. Rather, the natural and cultural resource staff needs to be in direct support of DPTM, with a single point-of-contact to facilitate coordination and support. Existing "technical" staffs should remain in DPW offices.

2.2.3. Move the entire "environmental operation" to DPTM. This would resolve the separatist trainer vs. environmentalist mentality that currently exists.

2.2.4. Develop standard ITAM staffing model which can be adjusted to installation-specific requirements. The model must include installation flexibility to use in-house personnel or contractors where desired. Installations should consider best use of money.

2.2.5. ITAM should be coordinated by committee composed of the training and environmental and engineer offices. The lead on this committee should be the range control representative.

2.2.6. Each installation should have a single representative in dealing with local regulatory agencies and other external organizations.

3. Educate

3.0. Provide a comprehensive, installation-level environmental awareness training program. This should include both increased awareness of environmental considerations for soldiers and increased awareness of training mission requirements for civilians. Training is needed in pollution prevention and in the care and protection of cultural and natural resources to prevent and/or reduce avoidable damage and violations of the law.

3.1. Provide installation command staff level training package. Emphasis the Army stated policy of conserving natural and cultural resources and promoting environmental awareness. Recommend to the installation commander and his staff that the commanders evaluations of unit leaders include environmental stewardship considerations. Emphasize the specific environmental responsibilities and capabilities of each individual staff element and his/her role as it applies to the training mission. Recommend that incoming field operations/training units' environmental coordinators be given an environmental briefing. Recommend that the civilian and environmental community learn more about the training mission. Suggest that the commanders' evaluation reports include compliance statistics.

3.1.1. Provide simple, cost-effective environmental awareness programs that are installation specific. Local conditions and problems are different, and each state approaches environmental issues differently from a regulatory standpoint. As a result, standardized environmental awareness materials must be adaptable to local situations.

3.1.2. Educate land users and maintainers on incorporating environmental concerns and principles for conserving natural resources into their work.

3.1.3. Provide environmental and natural/cultural resource briefing packages for use during preparation for major field operations/training events and at all range field operations/training briefings. Environmental awareness programs should be presented along with routine installation range instruction (e.g. safety materials, regulations, briefings) so as not to minimize it's importance.

3.1.4. Provide training for unit environmental coordinators.

3.1.5. Provide training material for use by unit environmental coordinators. Troops should be instructed on natural and cultural resource conservation.

3.1.6. Provide training for the civilian community on the local military training mission. Provide training outreach, including PAO staff.

3.1.7. Provide training to augment the environmental staff's knowledge of military training. Currently, an individual's knowledge of the training mission varies depending

on past military training experience, willingness to learn, and the ability of installation trainers to provide assistance. Individuals may learn about field operations/training activities by participating in staffing of units' field operations/training exercises and accompanying units to the field, where practical.

3.1.8. Provide environmental awareness training for visiting units, to include other government agencies, civilians and contractors, in a manner similar to range safety briefing procedures.

3.1.9. Provide access to current federal, state and local environmental cultural and natural resources laws and regulations pertaining to each installation. (Suggested methods include providing CD ROM disks and/or access to the Defense Environmental Information Exchange (DENIX) system, an electronic bulletin board of environmental laws and regulations.)

3.1.10. Provide "executive" training for installation ITAM/land management team personnel on requirements for interpreting, applying, and conforming with all applicable laws and regulations. Training should be for personnel in all key areas: training, range control, natural and cultural resources, facilities engineering, and construction. Audience should include resident and "visiting" environmental, engineering, and legal staffs. Provide the opportunity to work with technical experts.

3.1.11. Provide technical training for Land Condition Trend analysis (LCTA), Geographical Information System (GIS), and Land Rehabilitation and Management (LRAM) personnel. Provide cross-training of these personnel. (e.g. train LRAM personnel to use the GIS.)

3.1.12. Provide a structure for integrated ITAM seminars and meetings that cover all aspects of ITAM including training. For example, the existing LRAM conference could be expanded to include LCTA and EA, etc., and both trainers and natural resource managers can participate.

3.1.13. Environmental awareness programs for military personnel and mission awareness programs for civilian land managers should both be managed jointly between trainers and natural/cultural resource management personnel. This information should be incorporated into environmental and range and training regulations as well.

3.1.14. Provide an outreach program to train installation personnel on 1)how to work most effectively with environmental agencies during consultations, mitigation, or meetings; and 2)how to represent the installation to local media.

3.1.15. Institute dialogue between trainers and natural/cultural resource personnel through regular meetings and educational briefings. This will contribute to a more integrated and less antagonistic approach to land management.

3.1.16. Provide methods to assess the effectiveness of the education program. Trainer and environmental staffs should participate.

3.1.17. Provide education packages that are easily updated and reproduced.

4. Inventory the Natural and Cultural Environment

4.0. Provide a means for installation training land managers to measure and monitor natural and cultural resources. Data from many sources establishes a baseline inventory and can be used to assess the condition of resources. Periodic monitoring provides essential information for evaluating trends in natural resource conditions that can be summarized and statistically analyzed at the installation level. The basic inventory and monitoring system is critical to effectively manage natural and cultural resources.

4.1. Provide protocols, procedures and methods for establishing an installation natural and cultural resource baseline inventory and assessing the condition of natural and cultural resources. Evaluate existing Land Condition Trend Analysis (LCTA) standard and special use plot methodologies. Evaluate remote sensing, aerial photography and other technologies for applicability to ITAM. Provide for improved efficiency in data collection, where possible.

4.1.1. Establish the minimum acceptable scientific and legal basis for inventorying and monitoring for all disciplines. Scientifically acceptable methods for inventorying, monitoring, and predicting conditions/impacts are necessary to provide the basis for coordinating with users, regulators, community groups and others with an interest in the condition of military lands. These efforts are often the result of requirements to comply with laws and regulations such as the National Historic Preservation Act, Native American Grave Protection and Repatriation Act, the Clean Water Act, the Endangered Species Act, and the National Environmental Policy Act.

4.1.2. Establish the "Army standard" data items that should be collected to provide information to support training land management. Provide for addition or deletion of data elements to allow adaptation for specialized local requirements. Data and information should be maintained in a standardized format to allow reporting to MACOM and DA.

4.1.3. Establish the minimum necessary monitoring frequencies to identifying and evaluating trends in the condition of natural and cultural resources.

4.1.4. Establish sources of data that can be used to supplement data collected for ITAM. Review existing government sources, outside agencies, and installation natural and cultural resource surveys such as: The U.S. Fish and Wildlife Service, The Soil Conservation Service, the Nature Conservancy, USDA Soil surveys, endangered species surveys, wetland surveys, installation forest survey, installation wildlife census, and available satellite imagery.

4.1.5. Required data for ITAM includes flora/fauna surveys, soil classification information using USDA and Soil Conservation Service surveys, climatological and meteorological data; topographic features, hydrology, wetlands delineation, air and water quality, noise contours, and identification of archeological and cultural resources. Data to evaluate the effects of noise, fire, wind and water erosion, shoreline erosion are also required.

4.1.6. Provide standard statement-of-work documents for natural and cultural resource data collection contracts. For smaller installations, consider establishing a regional ITAM center of expertise for more cost-effective data collection.

4.1.7. Provide the capability to support cooperative ventures with other agencies, academia, and professional societies.

4.1.8. Provide methods to assess the effectiveness of natural and cultural resource inventorying and monitoring programs. Training and environmental staffs should participate.

4.1.9. Ensure that the ITAM data collection and analysis process/methodology allows for changing requirements and new approaches. The recent emphasis on biodiversity and ecosystem[13] management and changes to environmental laws and regulations are examples of new approaches and changing requirements.

4.1.10 Consider ecosystem and regional land management principles in restructuring the LCTA inventorying and monitoring methods. The trend is to recognize that management of an individual problem and its special solution is not effective without integrated consideration of other problems, causes, effects and solutions.

4.1.11. Provide rules, methods and procedures for performing natural and cultural resources condition-trend analysis.

5. Inventory Training Requirements and Assets

5.0. Provide a training space utilization baseline to include frequency, duration and intensity of events. Consider utilizing existing systems such as RFMSS and DIRT. (Requires development of interfaces and management coordination.)

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[13]Biological diversity, or biodiversity, is the variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. An ecosystem, very generally, encompasses all biological and physical matter, interactions, and processes within a defined area. The boundary of an ecosystem is natural rather than political. It might be the edges of an aquatic system such as a pond, or it might be the boundary of a certain geophysical-vegetative entity such as a watershed.

5.1. Establish training baseline:

5.1.1. Identify and catalog the types of units (AC, RC, and foreign military) that habitually train at each installation.

5.1.2. Identify mission of each type unit.

5.1.3. Identify METL and tasks of each type unit.

5.1.4. Catalog training space required to conduct METL and task training for each type unit.

5.2. Record training space utilization by unit and unit type.

5.2.1. Identify annual training days by unit for each category of training space.

5.2.2. Identify annual training days and throughput of specific ranges and training areas.

5.2.3. Identify use of training ranges and training areas by other services, governmental agencies, and non-government organizations.

5.2.4. Record ammunition expenditures by type and by range for dud-producing or otherwise potentially environmentally hazardous ammunition.

5.3. Record non-training activities conducted on training space.

5.3.1. Identify all hunting and fishing by location, season, density, and mode of transportation.

5.3.2. Identify agriculture/forestry activities by type, location, and dates.

5.3.3. Identify cultural events (religious ceremonies, archeological recovery, etc.) by activity, dates, and location.

5.4. Record seasonal and climatic considerations and restrictions that prevent or impact usage of training areas.

6. Provide Geographical Information System (GIS) Capability

6.0. ITAM should collect data and provide information to allow for display of spatial data on Geographical Information Systems (GIS). This would include display of multiple map layers for evaluation of interrelationships of elements. Electronic exporting and importing of data and information from other technologies and systems is required.

6.1. Provide a standard GIS system to all ITAM installations which is compatible with the Sustaining Base Information System (SBIS) effort. (Prepare alternative plans

for a standard installation GIS in the event the SBIS effort is delayed or cancelled.) For ITAM use, the standard GIS requirements are as follows:

6.1.1. Provide a GIS that is cross-functional (supports natural resource managers, trainers, master planners, etc.); that provides information and access at the installation, MACOM, and DA level; that supports vector and raster data formats; that is easy to interface to various commercial DBMS; is cost-effective; and has easy to use display tools.

6.1.2. Provide a GIS that is "user-friendly". It should minimize steps and keystrokes, minimize required training, and minimize required knowledge of the underlying operating system and file structure, etc. It should be easy to learn use. For example, the GIS may incorporate features such as drop down menus and on-line help.

6.1.3. Provide a network capable system which can employ standard DOS personal computers as work stations in a multi-user, multi-tasking environment.

6.1.4. Provide the capability to produce customized installation maps with individually selectable multiple data layers. The number and type of data layers shall be determined through coordination with natural and cultural resource managers, trainers, and engineers while also considering the requirements for RFMSS, RMAT, RPLANS, etc. Map scales shall be selectable and should include at a minimum 1:50,000, 1:25,000, 1:12,500, 1:5,000, 1:1,000, and 1:500, with display on Universal Transverse Mercator (UTM) grid lines. Where elevation contours are shown, the contour interval shall be selectable to the fidelity of the available data. The system should provide both hard-copy printouts and on-screen displays of geographical and/or tabular data as required. Where seasonal variations occur, more than one map layer should be provided for each significant season. The system will also incorporate noise prediction models of military training events to include firing point specific output, based upon weapon system, terrain and weather conditions. Graphic representation of noise contours must be integrated with other map layers for on-screen display or for producing hard-copy maps.

6.1.5. Provide a suite of GIS applications for commonly performed land management functions that are flexible, modular, and can be tailored for use by a particular installation whereby: 1) installations can select only those application modules that are suitable for their needs, 2) installations can customize these applications and their interfaces for their own use, and 3) the addition or customizing of a module can be done in a simple manner which does not require code modification.

6.1.6 Provide a suite of GIS applications for commonly performed land management functions that allow "one-button" operation.

6.1.7. Establish and maintain an up-to-date catalog of existing GIS applications which have been developed for/by individual installations, and provide access to these applications for use by other installations.

6.1.8. Provide a "user-friendly" interface with existing commonly used GIS systems such as the Geographic Resources Analysis and Support System (GRASS).

6.1.9. Provide the capability to display trends in natural and cultural resource conditions, training utilization, and other factors such as climatological data. Include capability to project "what-if" trends and scenarios.

6.1.10. Evaluate the capability of importing Global Positioning System (GPS) data used on military vehicles from range control/training systems (e.g. RFMSS, WSLOCS) to the ITAM GIS for plotting the distribution of training across an area. This information can then be used in assessing and predicting training impacts.

6.1.11. Evaluate the capability of integrating ITAM spatial data on environmentally sensitive areas with on-vehicle GPS systems. This technology can be used for land managers and trainers to manage and monitor encroachment into off-limits areas during training exercises.

6.2. Provide a relational DBMS that is capable of storing and manipulating spatial data for display on the ITAM GIS. The DBMS should support other ITAM program elements and support data import/export to/from other systems, such as RFMSS and RMAT.

6.2.1. The GIS DBMS will include layers for digital elevation, safety zones, wildfire danger areas, training areas, roads, installation boundaries, restricted areas, airfield safety/clear zones, cantonment area, topography, floodplain, wetlands, sensitive natural areas, soils, threatened and endangered animals, threatened and endangered plants, historic preservation areas, archeological sites, air quality, noise, open space and buffer areas, contaminated areas, impact areas and recreation areas. The system will gather and store information daily on weather, noise, and fire prediction.

6.3 Establish regional centers of GIS expertise to provide GIS services in a timely manner to those installations where local GIS capability cannot be supported due to funding or personnel constraints. GIS services include data entry, data maintenance, data analysis, reporting, and production of hard-copy maps.

6.4. Provide methods to assess the effectiveness of the ITAM GIS and supporting DBMS. Trainer and environmental staffs should participate.

7. Integrate Training and Environmental Requirements

7.0. The integration, prioritization, and balancing of training land conservation and mission requirements will require professional cooperation and coordination between installation staff elements representing training, land maintenance, and environmental considerations. ITAM must support tough, realistic training balanced with land sustainment, compliance, and conservation; all within the reality of available resources. Prioritization of requirements and the resources necessary to achieve these objectives

will be required. Similar efforts at integration will be required at the MACOM and DA levels.

7.1. Develop an integration process model for trainer, engineer and natural and cultural resources staffs to share information, coordinate, and consider alternatives. Because ITAM is a trainer program, this will be under the leadership of the trainer. The process may include meetings, automation tools and other process models.

7.2. Develop a method to optimize allocation of training activities to maximize use of current assets to support training under realistic conditions while minimizing land damage. Include provisions for incorporating existing and new training and environmental requirements into the process.

7.3. Provide a comprehensive, centralized land management system and supporting tools. Provide cost-effective, state-of-the-art tools to support successful integrated training area management and stewardship. System and tools must provide data analysis and graphic support for decision-making involving land use and allocation.

7.4. Provide methods to combine environmental, training and other land management information in graphical and tabular formats. This would facilitate identification of commonalities and conflicts and would be a basis for consideration of scheduling, prioritization, etc.

7.5. Integrate environmental/natural resources and training requirements in Standard Operations Procedures (SOPs) to accomplish the following:

7.5.1. Improve the staffing process for developing and disseminating training requirements of new weapon systems to include training and environmental staffs.

7.5.2. Ensure that trainers integrate environmental considerations into training requirements through coordination with the installation environmental staff on all SOP's and regulations dealing with training lands. Integration of environmental concerns early on will improve compliance.

7.5.3. Improve environmental understanding and consideration of the training mission when establishing requirements and when consulting with regulatory agencies.

7.5.4. Improve installation training maps by including environmentally sensitive site overlays (e.g. cultural resources, threatened and endangered species) for all training elements. This will ensure situational awareness for training elements in field environments.

7.6. Integrate National Environmental Policy Act (NEPA) requirements into the training land management process and documents.

7.7. Develop methods to support training on a regional basis for those installations having temporary environmental restrictions on certain training functions. This will

encourage training on environmentally suitable lands. Temporary restrictions might be due to seasonal considerations or because of land maintenance and repair activities.

7.7.1. Develop a regional data base of installation training land and facilities and their capabilities for supporting specific training missions. This will support the scheduling of training land and facilities across installations using RFMSS.

7.7.2. Develop a procedure to transfer specific installation training requirements to other regional installations to allow installations in environmental "trouble" to suspend training for restoration purposes.

7.8. Develop an interface with the Range Facility Management Support System (RFMSS) which provides ITAM with training and operations information that is relevant to land management.

7.8.1. Provide a decision on the appropriate "integration point" of noise management systems and data. While most ITAM functions are not "near real time", noise may be. Therefore, noise monitoring and management may be more appropriate for integration with RFMSS, which supports real-time operation at the firing desk.

7.9. Develop regional methods and support for contracting, design, and other activities to improve efficiencies, share lessons-learned, and avoid duplicating mistakes.

8. Predict Carrying Capacity and Usage Impact

8.0. One of the objectives of ITAM is to allocate land usage based on the ability of the land to sustain those uses. A method for predicting the carrying capacity of the training land must be developed to achieve this objective. The land allocation process also requires capability to predict the impact of individual events. Discussions at the ITAM user requirements workshops provided questions which should be addressed in the process of establishing predictive methods.

8.1. Define "Carrying Capacity" as it relates to training land utilization. The definition must provide a common ground for trainer, environmentalist and engineer. (The beginning of this approach is the current effort to define terms in the engineer's AR 415-28 and the trainer's Defense Installation Range and Training Area (DIRT) database, and to coordinate engineer, environmentalist and trainer input into the Real Property Management Tool (RMAT).)

8.1.1. Define all requirements for the different "users" of carrying capacity:

a. Include a short-term-micro measure to support the installation trainers' and land managers' scheduling and maintenance objective of maximizing usage while minimizing maintenance and repair requirements.

b. Include a long-term-macro measure for installation master planners, and for use at MACOM and DA levels.

c. Include environmental requirements for conforming to the ecological principles of carrying capacity to ensure that the current level and type of usage is sustainable over the long-term. This is a more refined requirement than item "a" above.

8.1.2. Determine an appropriate measurement unit for carrying capacity. Is it a number, a percentage, tracked vehicle days, foot training days or something else? Is it measured by impacts to natural and cultural resources, cost to repair damages, or potential compliance issues? If carrying capacity is a measurement of an asset that supports training, should the units of measure should be consistent with those of training requirements?

8.1.3. Provide methods for predicting carrying capacity for rehabilitated or "healthy" training areas as well as for degraded training areas. (For example, perhaps the predicted ideal carrying capacity of a training area is 7 training units, however in its present condition its predicted carrying capacity is 3 training units.)

8.2. Provide methods for predicting the usage impacts of various activities including training, non-training, and natural events. Consider the objectives of maintaining acceptable air and water quality, keeping soil erosion within acceptable limits, sustaining the diversity of native plant communities, managing wildlife for optimum density and diversity, and protecting and preserving significant cultural and historic resources.

8.2.1. Develop a database of historic impacts for different training events and other land uses on a given area.

8.2.2. Provide methods for combining the predicted impacts of singular events to predict combined or cumulative impacts.

8.2.3. Provide the capability to determine what is an expected and acceptable level of damage caused by certain training events as opposed to what is unnecessary or excessive degradation of the land.

8.2.4. Provide capability for predicting the impact of new weapons systems and new training requirements as they emerge.

8.3. Evaluate the possibility of providing an automated tool for modeling and predicting carrying capacity and usage impacts. An ideal automated carrying capacity tool would allow several options for selecting field operations/training events and facilities and doing "what-if" type analysis of alternatives. At issue is whether carrying capacity is too complex of a concept to model, quantify, and automate exactly.

8.3.1. Investigate existing efforts in predicting carrying capacity and impacts.

a. Evaluate the CERL, Texas A&M, and Colorado State project to determine carrying capacity on three or four installations representing different geographical regions.

b. Evaluate the validity of the Maneuver Area Damage Assessment Model (MADAM) at Ft. Hood for use at other installations.

8.3.2. Provide a method/tool to encourage users to break old habits of reusing the same areas without considering other alternatives. Include "what if" analytical capabilities to predict impacts of potential training activities.

8.3.3. Provide a "feed-back" loop in carrying capacity models/tools to allow refinements of the predictions based on observations of actual impacts.

8.4. Provide methods to assess the effectiveness of carrying capacity predictive models. Trainer, engineer and environmental staffs should participate.

9. Repair and Maintain Land

9.0. Installations will employ a variety of methods to maintain, repair, or rehabilitate land, depending on the locations and the severity of the land condition, as follows:

9.1. Design and develop a systematic approach to land management and repair that integrates field operations/training with environmental/natural resources activities and provides funding to support ongoing activities.

9.1.2. Develop regional or installation-specific methods to predict the dollar requirements for repair of land due to field operations/training activities based on predictive carrying capacity models.

9.1.3. Consider innovative methods for employing installation equipment and personnel (civilian and military) in accomplishing LRAM projects. For example, engineer units can be used for construction projects which complement their training objectives.

9.1.4. Employ conservation-oriented land management practices when feasible. For example:

9.1.4.1. Harden training sites with high usage such as bivouac areas, identify highly erodible soils and initiate soil conservation practices before problems arise, and pave range roads near cantonment and civilian population areas.

9.1.4.2. Employ vehicle dust abatement procedures (e.g. watering of unimproved range roads) wherever feasible.

9.1.4.3. Allocate training activities throughout the training area to minimize degradation of native vegetation and soil erosion.

9.1.4.4. Develop land maintenance rotation schedules whereby individual training areas are periodically made unavailable for certain types of training activities so that maintenance activities (e.g. reseeding, tilling, replanting trees) can occur. This may require closing areas to training for 1 to 3 years. Optimal schedules will maximize training availability and minimize maintenance costs.

9.1.4.5. Develop land maintenance schedules/methods for heavy use training areas which do not require making the area unavailable to training for long periods of time. For example, maintenance activities such as tilling, reseeding, and replanting can be initiated during the prime growing season when they are most effective.

9.2. Provide methods to assess the effectiveness of the land repair and maintenance program. Trainer, engineer and environmental staffs should participate.

10. Decision Support Systems

10.0. ITAM should assist the land managers in the decision-making process in balancing maximization of training usage, maintenance and repair activities, and sustainment of natural and cultural resources. A decision support system is needed to integrate the four traditional ITAM components, available GIS information, and other training and natural and cultural resources systems and information.

10.1. Provide a decision support system to integrate the total training land management process. Integrate applicable information from all elements of ITAM as outlined in this document.

10.1.1. Provide accurate data for scheduled and actual range and maneuver area utilization for use in analyzing and predicting training impacts. This data includes the location, unit, training event, number and type of vehicles, number of personnel, type of weapons and ammunition, and date/time/duration of the event.

10.1.2. Provide methods/tools for training-related noise prediction, monitoring, and management.

10.1.3. Provide methods/tools to assess, monitor, and predict air quality based on training-related dust pollution levels.

10.1.4. Provide methods/tools to analyze and predict impacts of military and non-military land uses on natural resources.

10.1.5. Provide methods/tools to assess, predict, and do what-if analysis regarding where and when repair and maintenance of land is needed and at what cost in terms of dollars and training.

10.1.6. Provide methods/tools to support efforts at rotating training between different training areas by evaluating the effectiveness of these programs and determining optimal rotation and maintenance schedules.

10.2. Provide methods/tools to determine the military carrying capacity of training lands based upon mission requirements, environmental conditions and considerations, and mission impacts.

10.3. Provide information for project development and preliminary environmental assessment for siteing new projects and for major rehabilitation projects.

10.4. Provide information necessary for evaluation of decisions to purchase, lease, or "close" training land. Include support in assessing condition and utilization of existing land, and in analyzing alternatives.

10.5. Provide methods/tools for sharing information with trainers concerning natural and cultural resource issues which are relevant to the training planning process (e.g. restricted use areas, off-limits areas, highly erodible areas, sensitive vegetation, current conditions, seasonal considerations) through GIS data layers, hard-copy maps, or through automated range scheduling systems.

10.6.1. Provide methods/tools for sharing tactically significant natural resource information with trainers to enhance training (e.g. locations of appropriate vegetation for tactical concealment and appropriate soil types for excavation.)

10.6.2. Provide methods/tools for sharing information with trainers on how their activities affect the land and on how to adapt field operations/training according to the condition of the land to minimize impacts.

10.7. Provide methods/tools to develop commanders' environmental risk assessments of training activities.

10.8. Evaluate use of checklists such as that in TC 5-400 for preparing environmental risk assessments of major training events.

10.9. Provide methods/tools to analyze and optimize land allocation decisions for military and non-military uses such as forestry, agriculture, and recreation.

10.9.1. Provide methods/tools to improve training allocation and training distribution decisions based on mission and natural and cultural resource considerations. Such tools would support "what-if" type analysis and should be integrated with training scheduling systems.

10.9.2. Provide a method/tool to assist in the design, allocation, and management of training space which would include 1) an automated compilation of all field operations/training and the ideal type of range or maneuver space required, and 2) degraded training capabilities "what-if" type analysis that trainers can apply based upon terrain and other unique environmental characteristics.

10.9.3. Provide methods/tools to assist in fielding new weapon systems; siteing new or unique training activities; and siteing and construction of maneuver areas and ranges

(including MCA) based upon environmental and mission considerations including the preparation of related NEPA documentation (REC's, EA's, EIS's).

10.10. Establish general processes and methods for information sharing and communication between trainers, natural and cultural resource personnel, and range control.

10.10.1. Provide data and methods/tools to support cross-functional development of the Integrated Natural Resource Management Plan, the Installation Master Plan, the Integrated Site Development Plan, and related NEPA reporting requirements (REC's, EA's, EIS's).

10.11. Provide methods/tools to support and streamline the NEPA documentation process including 1) developing generic EA's for each training activity that could be populated with local environmental information as each installation requires, and 2) a process for submitting prioritized EA requirements to the MACOMs for funding.

10.12. Provide tools to support installation, MACOM, and DA-imposed reporting requirements in the specified formats while allowing flexibility at the installation level.

10.13. Evaluate the capabilities of existing systems such as DENIX, RMAT, RFMSS, SATS, DIRT, CRIS, X-CRIS, MADAM, ASDZ, etc. for providing data and decision support within ITAM.

10.14. When providing ITAM systems, ensure that 1) there are people available to operate them, 2) there is funding and support for the entire system lifecycle, 3) systems are not overly-complicated for the intended users, 4) data collected and maintained is suitable for the decisions and analyses that are required, 5) The appropriate level of information and support is provided to all people at all levels.

10.15. Develop standards for data collection, data reporting, and data sharing that are hardware/software platform independent, but that allow cross-platform interoperability and are consistent with other DA, DoD, and Federal Government systems standards.

11. Provide Reports

11.0. Reports may be in electronic or hard-copy format and consist of compiled data, maps, or listings for installation, MACOM, and DA use. Reports topics include wetlands, threatened and endangered species, vegetation, wildlife, military and non-military usage, land repair and maintenance activities, air and water quality, noise, fire hazard, soils, and cultural resources.

11.1. Report spatial and tabular data/information on wetlands.

11.1.1. Reports will include wetland areas delineation, baseline natural resources data (e.g. soils, vegetation, moisture) to characterize each wetland area, wetlands

modifications (net loss, gain), and management considerations for siteing, scheduling and conducting training.

11.1.2. Report spatial and tabular data/information on threatened and endangered species (both flora and fauna).

11.1.2.1. Reports will include species identification, state and federal threatened and endangered status, estimated and projected population and geographic distribution, critical habitat identification and location, and management considerations for siteing, scheduling and conducting training.

11.1.3. Report spatial and tabular data/information pertinent to fire management.

11.1.3.1. Reports will include vegetation and soil moisture content, estimates of current fire hazard by location, prediction of fire hazard levels based on projected training and climatological factors, and management considerations for siteing, scheduling, and conducting training.

11.1.4. Report spatial and tabular data/information pertinent to noise management.

11.1.4.1. Reports will include noise contours for military activities (vehicles, weapons, and aircraft), projections of noise levels based on scheduled training and climatological factors, real-time estimates or measurements of noise levels based on current training status, and management considerations for siteing, scheduling and conducting training. Consider the use of the FIRE system as a method for acquiring and reporting information related to noise management.

11.1.5. Report spatial and tabular data/information pertinent to cultural resource management.

11.1.5.1. Reports will include archeological sites, Native American significant sites, cemeteries, historic sites, and management considerations for the siteing, scheduling, and conduct of training. Consider the use of the Cultural Resources Inventory System (CRIS) and X-CRIS as a method for acquiring and reporting information on cultural resources.

11.1.6. Report spatial and tabular information data/information on soils.

11.1.6.1. Reports will include soil characterization (e.g. type, moisture, compaction), load bearing capability, erosion potential, predicted and actual soil loss due to training and other uses, and management considerations for the siteing, scheduling, and conduct of training.

11.1.7. Report spatial and tabular data/information pertinent to air and water quality.

11.1.7.1 Reports will include surface water distribution, air and water (surface and subsurface) quality measurements, prediction of air and water quality based on

scheduled training, and management considerations when siteing, scheduling and conducting training.

11.1.8. Report spatial and tabular data/information on vegetation.

11.1.8.1. Reports will include estimates of distribution, frequency, and abundance by species, plant communities map, predicted population distribution based on scheduled training and climatological factors, and management considerations for the siteing, scheduling, and conduct of training.

11.1.9. Report spatial and tabular data/information on wildlife.

11.1.9.1. Reports will include estimates of distribution, frequency, and abundance by species, migratory paths for avian and non-avian species, predictions of future population distribution based on training and climatological factors, and management considerations for the siteing, scheduling, and conduct of training.

11.1.10. Report spatial and tabular information on training activities pertinent to land and natural resource management.

11.10.1.1. Reports will include training event, training location, weapons/ammunition used, date/time/duration, number and type of vehicles used, unit type and size, and location of bivouac, excavation, and demolition activities.

11.1.10.2. Evaluate the use of the RFMSS system as a method for collecting and reporting training capabilities and training utilization information.

11.1.10.3. Evaluate use of the DIRT database to characterize the training capabilities of particular ranges and training areas.

11.1.10.4. Standardize the type of data and level of detail that is collected by range control in the scheduling process for use in analyzing specific impacts of training events, to include graphical information on training scenarios.

11.1.11. Report spatial and tabular data/information on non-military land uses.

11.1.11.1. Reports will include information on forestry, grazing, agricultural out-leasing, and recreation such as historical, current, and projected usage, and management considerations for the siteing, scheduling, and conduct of training.

11.1.12. Report spatial and tabular data/information regarding land maintenance and repair activities.

1.1.12.1. Reports will include range/training area maintenance and repair schedules; current project locations, descriptions, and status; projected maintenance and repair requirements and costs based on environmental conditions and level of use, and management considerations for the siteing, scheduling, and conduct of training.

11.1.12.2. Report spatial and tabular data/information in the form of a coordinated training and maintenance/repair schedule for each installation that allows for adequate recovery of areas that have been seeded, reforested, etc. before training is resumed.

11.1.12.2.1. Develop a rotation schedule for range and maneuver areas whereby areas are removed from the training base periodically and allowed to recover. The frequency and duration of the rotations should be fine-tuned as the effectiveness of the program is assessed and monitored.

11.1.12.3. Report spatial and tabular data/information regarding current and projected condition/status of training areas to unit commanders and range control personnel for use in scheduling.

11.2. Report capabilities and constraints for ranges and maneuver areas in a tabular format to include environmental considerations, and use this information as part of the scheduling process.

11.3. Report spatial information on environmental constraints and restrictions to training in a format (maps, GIS) that is helpful to trainers in siteing new ranges/maneuver areas and in scheduling and planning field operations/training exercises.

11.4. Generate reports automatically and/or through remote access for MACOM and DA staff when appropriate in order to reduce the amount of time spent by installation personnel in responding to data calls.

11.5. Review and address existing reporting requirements such as the Real Property Utilization Report, the Annual Utilization Report, and reports mandated by AR 210-21.